

Flight, June 8, 1916.

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.



LAST week's great naval encounter, in which, as everyone anticipated, Britain emerged doubly victorious on the sea, at the same time justified all the past work and expenditure by the Germans upon their Airship fleet. It is, we verily believe, largely due to the scouting of these craft, that the German Navy did not come nigh unto being exterminated. Having regard to the unexampled fighting odds which the German Navy started the battle with, our small squadron should

have been easily disposed of by our enemies, and through their Zeps., in spite of the adverse weather, the German High Command were well informed as to the British units which they had to deal with. But nothing pleases our admirals more than an odds against fight, and in this case has it been once again demonstrated to the world that our naval fighting men take no count of chances against them so long as they can get to grips and inflict measurable injury upon their opponents. On the other hand, the German naval command has no stomach for a test of strength without they have an indisputable balance of ships on their side. They have for so long been voicing their anxiety to meet our Grand Fleet, that the ignominy of their hasty retreat is the more pronounced, following upon the information of the close proximity of our battleships conveyed to the German admiral in charge by the airships up above. Had our admirals had the same means of spying the movements of the German fleet, we fancy the enemy squadron would have had less opportunity than eventuated last week for scuttling back to their base without a general engagement. Ample evidence is forthcoming of the helpful part played by the Zeppelins in scouting for their very cautious sea partners, and all that Britons can do is to lament this horrible handicap under which our glorious Navy is holding the seas. Sincerely we trust these unequal conditions may not prevail completely for very much longer. Although we can hardly expect to overtake at one stride the enormous start which the Germans have attained in lighter-than air supremacy, we may look for a gradual reduction, we trust in the near future, of the great flaw in this direction, which now exists in our power for offensive tactics. How their prey was snatched from our gallant sailors is vouched for by the special correspondent

of the *Scotsman*, who, in a very graphic description of the battle, writes:—

"Over the fighting ships Zeppelin scouts of the enemy moved continually on the outlook for the main British forces, which, doubtless, the enemy regarded as certain to appear. It may have been on the guidance of his aerial scouts that the enemy apparently concluded that the Battle-Cruiser Squadron was at that time the only enemy in sight, and was not merely screening the British Battle Fleet. The enemy, heavily gunned and armoured, now closed in as much as possible, and the whole might of his battle fleet was turned on our Battle-Cruiser Squadron during an action which lasted fully two hours.

"The battle cruisers came to grips with the large forces opposing them about five o'clock on the afternoon of Wednesday. Thereafter the contest between the outnumbered cruiser squadron and the enemy raged till there came from one of the aerial scouts a message which caused the German fleet to change its course and attempt to seek shelter. The British Battle Fleet had been discovered approaching the scene of the action at full speed.

"The enemy had already suffered serious loss in the fighting during the hours which had elapsed. It was well that certain powerful units were working with the battle cruisers in this phase of the struggle. Between them they and the battle cruisers had accounted for several ships. Our losses had also been severe, but, considering the odds, not great. We had lost important ships, but the enemy's losses by that time had been sufficient to convince him that utter disaster was in store for him if he waited to oppose the British Battle Fleet. He turned southward."

As to the participation as fighting units of these Zeps. in the general *mêlée*, the *Scotsman's* correspondent describes one incident attaching to the "*Queen Mary*," which, however, there is good reason to believe has in it the elements of romance. He says:—

"The '*Queen Mary*' went down in the thick of action. There is a story amongst the men who have returned which shows that she fought at close range a German battleship, and whilst her great guns were busy with a more powerful and better protected enemy, one of the Kaiser's super-Zeppelins was hovering over showering bombs in an attempt to find a vital spot on the beauty ship of our battle-cruiser squadron. Busy as she was with her heavy guns, the '*Queen Mary*' and her gallant crew kept the anti-aircraft guns going. The story is that the Zeppelin was shot down in a blazing mass, and fell close to the ship, exploded, and was destroyed."

Corroboration of the co-operation of the Zeps. in advising the sea units as to the danger ahead, is found in the authenticated reports of the skippers of Dutch trawlers, who made the following statement to a special correspondent of the *Daily Telegraph*:—

"Advance squadrons of the German Fleet first came into conflict with the British cruiser squadron. The German cruisers were immediately supported by the biggest battleships, which were close at hand. The more powerful British ships were too far from the advance squadron to take an immediate part in the fighting. Before they reached the scene the Zeppelins had signalled their approach, and the German fleet at once broke off the engagement and made for its bases."

That the airships were also of value at night is vouched for by one of the crew of the super-Dreadnought "*Marlborough*," which was torpedoed, but returned to harbour safely. He told an Exchange Telegraph Company's representative that at one time there were six Zeppelins over the fleet, and they were a great help to the Germans in reconnoitring.

In the inky darkness (he said) their searchlights clearly showed the position of our Fleet. The Zeppelins dropped bombs amongst our men struggling in the water. In this respect nothing has happened that we have not from the first anticipated would occur, although we must wait for official confirmation of the statements enumerated above. In the meantime, there is little use in rubbing it in just now, but it is to be hoped that the real value of these very troublesome craft of the air is now sufficiently realised to ensure that the maximum effort will be persevered with to wipe out the severe disadvantage which at present is shrouding the successful operations of our naval fighting forces.

Civilian Flying Schools.

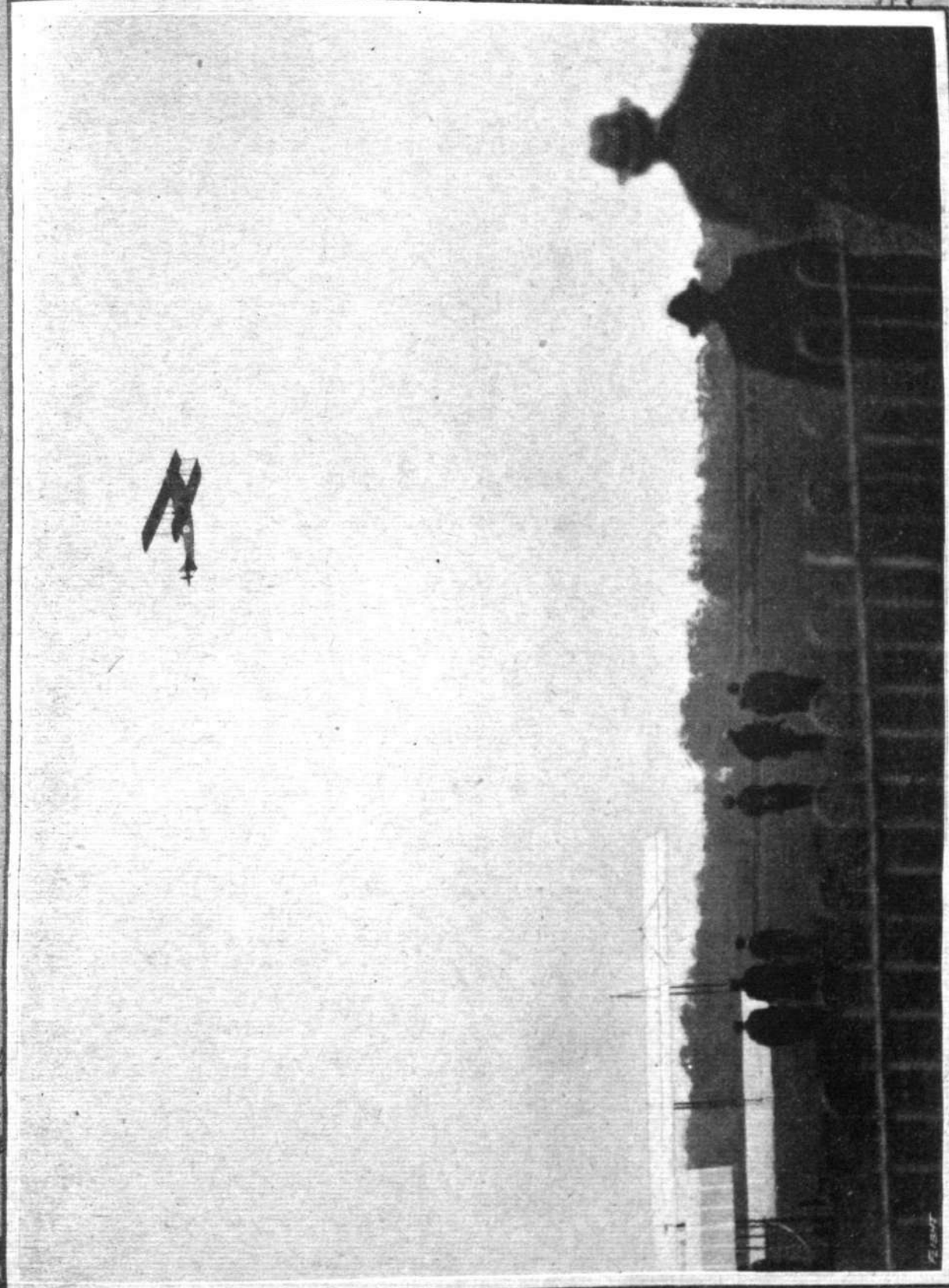
Elsewhere in this issue we publish a set of regulations for Civilian Flying Schools, which have been issued by and approved by the Royal Aero Club. We welcome these, and we believe that as a whole they will receive the support of all the present private schools which count in the scheme for initiating prospective pilots into the art of riding the air. If proof were wanted that the R.Ae.C. exercises its ruling functions with a considerate hand and with due regard to the interests of those who have helped in the development of the art of flying, it is to be found in the fact that a set of rules of the character of those now set out has not long since been put into force. Considerable latitude has been possible in the past in the methods obtaining at various schools, and in a very few instances there is no doubt that advantage has been taken of this to impinge on the rights and fair treatment of pupils who have joined up with those particular schools. There has been ample time to weed out these undesirables, and the status of the present existing civilian schools is sufficient to justify the delay in formulating a set of regulations, as the offenders have, by the natural law of the survival of the fittest, been automatically squeezed out of existence. Under the new regulations both the interests of the school and of the pupil are provided for with well-judged discrimination, and the acceptance of these rules as the guiding principle by the private schools, will, we believe, have the effect of surmounting the danger of extinction which has during the last few months loomed somewhat ominously upon the horizon of the civilian flying school. In actual practice some of the new regulations may possibly be found not to work as smoothly or happily as it is hoped. In that case, after a fair trial, we feel sure it will be only a matter for those in control of the various establishments to put forward their objections with suggested remedies in the form of amendments to any particular clause, for their views to be most sympathetically considered by the R.Ae. Club Committee, who have, we feel confident, no wish to force any unhealthy restrictions upon private enterprise. Any action upon the Committee's part is directed only at ensuring the permanent establishment of the civilian schools upon such a basis, that it must be to the interests of the country, and therefore also of the schools, that the Government should encourage them to further useful and vital work in helping to provide from the raw material a vast army of efficient air pilots, the unlimited supply of which is of such vast importance to the nation. With such a set of official obligations to work to, no pupil can expect other than to pay a reasonable tuition fee—cheap and nasty is particularly out of place in flying—and the effect will be to rule out in advance a number of inefficient who from the first are obviously unfitted to be in control of aircraft, and thus save valuable instruction time for the teaching of the man who is born with air hands. Following upon the acceptance of these new rules, we fancy there will be no dearth of pupils coming forward from both official and unofficial sources.

"Dilution" of Labour and Victory.

It is becoming evident as the months go by and the pressure upon labour becomes more and more intense, by reason of its depletion in reply to the necessity for maintaining our forces at the front, that the doors must be opened more widely than ever for increased output of munitions, to enable our armies to successfully cope with the enemy's unceasing hurricane of shells. Skilled labour by itself is undoubtedly limited, and is

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FLIGHT



Mr. Sydney Pickles flying a Curtiss at Hendon Aerodrome.

alarmingly short of being able to fill the bill. The goods, however, *have* to be delivered nevertheless by hook or by crook, or all sacrifices in lives and money of ourselves and of our Allies will, at the finish, have been in vain. The result, at best, if we fail to not only maintain but to increase our output of shells and guns, must inevitably be the patching up of some sort of peace compromise, more of the nature of a "truce"—a ten-year "truce" maybe—followed by another hideous attempt, probably even worse than the present orgy of crime, by the Huns at subjugating civilisation to their will. That no effort should be left untried to prevent such a ghastly possibility, there can be no two opinions. Therefore it behoves every individual unit of the populace to raise no obstacle to any organised scheme of an emergency nature, which will help to bring about such a supply of munitions as to ensure a complete and sweeping victory for the Allies, enabling them to dictate such terms of peace that the world will for a century or more be freed of the menace from the German barbarians which has during the last forty years exercised such a baneful influence upon the peaceful progress of the entire world. Recent pratings of peace carry with them the ring of unadulterated treason to civilisation. The cry for Peace when there is no possible prospect of peace under existing conditions, proclaims the cloven hoof of the blood-gorged German ruffian. Let none be deceived by such plausible temptations. Rather exploit every source of energy to increase our powers for retaliation, ten-fold if necessary, and let all previously accepted peace-time formulæ and regulations in regard to ways and means, whether it be from the point of view of man or master, go by the board. That this country has already risen to the occasion by reaching to a pinnacle of efficiency beyond the wildest imaginations of the Kaiser's advisers, is daily more evident from the intensified ragings of the German hordes. But there is still room for enormous expansion on our part in increasing the quantity of necessary munitions, and all should make it their business to see they do their bit towards helping to that end. The most promising solution to this side of the problem is to be found in largely increasing the "dilution" of skilled labour with unskilled helpers. The tentative introduction of this system into factories turning out munitions has not only proved the soundness of the scheme, but it has demonstrated the possibility of extension by the extraordinary success which has already attended the attempt to solve the situation by this means. Probably nothing more remarkable has been seen before in the shops of the world than this organised effort to produce the best results by the working side by side of skilled and unskilled operators. In a sense the word "unskilled" is literally correct, as the work which this new class of labour is called upon to carry through for the benefit of the nation is the outcome of a course of training for some particular operation urgently needful for the supply of some one single part, which enables the much-needed shell to be built up to completion for "delivery" to the enemy trenches. And the most satisfactory side of this organisation is that those comprising this new body of helpers are largely women. Except to those who have come into direct contact with the factories where these one-operation workers are giving such invaluable aid to the country's needs, it is incredible the advance in supplies which their co-operation has brought about. It is of the utmost urgency for the moment, therefore, for action to be taken in the direction of extending this move-

ment. Employers engaged on munition work should enter upon the preliminaries for introducing this specialised help into their shops in co-operation with their regular skilled employees. When properly explained to the men it would appear as impossible that they would not most heartily concur in helping to make the introduction of this one-operation employee a success. It is directly and indirectly to their best interests that no obstacles should be placed in the way. Although female labour is already a strong feature of aeroplane factories, there is still further scope for its further utilisation under the special conditions now advocated; and for ourselves we feel satisfied that so far as the firms which are engaged in things aeronautical are concerned, nothing but the most sincere goodwill to this end will be forthcoming. In most of the other shell and munition factories, it is true, the chance for expansion in this direction is very much greater by reason of the nature of the parts required. But if every trade does but its share towards speeding up by this means, the cumulative result is likely to be of a character to elicit the further admiration of the world to the latent energy still available, under emergency, in what the barbarous Huns would have the world label as a decadent race. Classes—in all cases free—for training these one-operation munition makers are already in full swing in London and other industrial centres—64 in all. In these can be seen the method of teaching from the first moment of the entry of the "pupil" into the school until he or she is turned out efficient to take regular turn at any shop at the particular machine for which tuition has been sought. It is only a matter for manufacturers to make known their immediate wants to the Ministry of Munitions or to, in London, the London County Council, to ensure in a very short space of time a supply of "unskilled" workers, well fitted to carry through the special operation which may, for want of skilled labour, be holding up the supply of shells by the thousand. We have had the opportunity of studying the system in operation, firstly at the schools where the pupils are initiated into the mysteries of lathes, &c., and subsequently at factories in full blast into which these same pupils have been drafted, and where they are as much at home at their individual one-operation jobs as if they had never known anything else all their lives; and yet *most* of these helps, until they entered the training school where they have been taught their "piece," had no idea what a lathe even looked like! We are filled with nothing but admiration at the result of this magnificent effort to speed on the goods so much required, and it now but remains for men and masters alike to avail themselves of this source of supply to make up for the forty years of preparation which the Germans had in hand when they embarked upon the present long-contemplated war, and so ruthlessly violated every recognised law of civilisation in their assurance that they were to carry all before them with one wild rush, and would never therefore be called upon to account for the bloody crimes which now attach to their unhallowed names.

That the system under which this addition to our manufacturing powers may be better appreciated, we reproduce elsewhere in this issue (see p. 486), a summary of the accommodation for training which is available at one of these London training schools. We commend this to our readers, and we shall hope that all those who have in any way the means of extending their operations will get in touch without delay with either the Ministry of Munitions or the London County Council.

The British Air Service

PER ARDUA AD ASTRA

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 31st ult. :—

Chief Petty Officer C. J. Turner, promoted to Temporary Sub-Lieutenant (R.N.V.R.), with seniority of May 28th, and appointed to "President II," additional, for R.N.A.S.

The following appeared among the Admiralty announcements of the 1st inst. :—

Lieut. R. Handcock to "President," additional, for R.N.A.S. undated.

Staff-Surgeon G. F. Syms to "President," additional, for R.N.A.S., May 26th.

Surgeon (Temporary) H. Wetherbee, to "President," additional, for R.N.A.S., May 31st.

Temporary Lieut. (R.N.V.R.) A. C. Wade to "President," additional, for R.N.A.S., May 31st.

Temporary Sub-Lieut. (R.N.R.) F. D. Casey, commission as Temporary Sub-Lieutenant (R.N.R.) terminated, May 27th, and entered as Probationary Flight Sub-Lieutenant (temporary), seniority of May 28th, and appointed to "President," for R.N.A.S.

T. M. Ritchie, granted a temporary commission as Lieutenant (R.N.V.R.), seniority of May 31st, and appointed to "President," for R.N.A.S.

The following appeared among the Admiralty announcements of the 3rd inst. :—

J. L. Pritchard, granted temporary commission as Sub-Lieutenant (R.N.V.R.), with seniority of June 2nd, and appointed to "President," additional, for R.N.A.S.

Temporary commissions as Sub-Lieutenants (R.N.V.R.), seniority of June 2nd, have been granted to J. H. Green (Lance-Corporal, 4th Batt. Seaforth Highrs.) and N. L. Silvester, and both appointed to "President," additional, for R.N.A.S., June 4th and 5th respectively.

Royal Flying Corps (Military Wing).

The following appeared in the *London Gazette* of the 30th ult. :—

Flight-Commanders, from Balloon Officers.—May 1st, 1916: Lieut. G. F. H. Faithfull, 126th Baluchistan Inf., Ind. Army, and to be Temporary Captain whilst so employed; Capt. J. P. Shelley, R. Lanc. R.

Flying Officers.—May 12th, 1916: Second Lieut. (Temporary Lieut.) E. K. Anderson, High. L.I. (T.F.); Temporary Second Lieut. L. G. Paget, Res. R. of R.H. Gds., and to be transferred to the General List; Second Lieut. H. V. Pendavis, D.S.O., Oxf. and Bucks L.I., and to be seconded; Second Lieut. K. P. MacNamara, Special Reserve, from an Assistant Equipment Officer. May 14th, 1916: Temporary Second Lieut. N. B. Fuller, K.R. Rif. C., and to be transferred to the General List. Second Lieutenants, Special Reserve: G. S. Thorne, S. N. Cole, C. J. Q. Brand. *From Flying Officers (Observers).*—May 15th, 1916: Second Lieut. A. D. Bell-Irving, Gord. Highs., Special Reserve; Temporary Second Lieut. H. C. Evans, General List.

Assistant Equipment Officers.—May 13th, 1916: Second Lieut. F. A. Crispin, Special Reserve; Second Lieut. C. N. Seemann, Special Reserve; Temporary Second Lieut. O. W. Clapp, General List.

Memoranda.—To be Temporary Second Lieutenants for duty with the R.F.C.; May 27th, 1916: Cpl. Hugh D. Hamilton, from 10th New Zealand Mounted Rifles; Pte. Frederick Crisp, from Inns of Court O.T.C.; Pte. Dudley H. Broughton, from City of London Yeo. (T.F.); Pte. Aubrey B. Raymond-Barker, from Inns of Court O.T.C.

Supplementary to Regular Corps.—Second Lieutenants (on probation), confirmed in their rank; G. S. Thorne, S. N. Cole, F. A. Crispin, C. N. Seemann, and Oscar C. Morison.

To be Second Lieutenants (on probation): Ruskin Watts; April 18th, 1916. Harold W. Sidley, Ernest E. Glorney, Percy V. Tanner, Norman A. Phillips, John I. Jones, Pierre B. Pattison, Frederick Scarborough, Julian R. Verel, Evelyn P. M. Shaw, Harry A. Rigby, John V. A. Gleed, Henry E. R. Fitchat, Cyril D. Bennett, Francis S. Rowe, Llewellyn L. M. Evans, Andrew Roberts, Beavan W. Pitt, George H. Lee, Alan S. Hett, William S. Frackleton, Percival A. Symmons, and James P. Stephen; May 27th, 1916.

The following appeared in a supplement to the *London Gazette* issued on the 1st inst. :—

Squadron-Commander.—Qmr. and Honorary Lieut. (Temporary Capt.) A. Fletcher, from an Equipment Officer, and to be Temporary Major whilst so employed; Feb. 29th, 1916.

Flight-Commanders, from Flying Officers, and to be Temporary Captains whilst so employed.—May 15th, 1916: Lieut. F. F. Minchin, 7th Can. Inf. Bn.; Temporary Lieut. W. D. Long, A.S.C., and to be transferred to the General List.

Flying Officers.—Second Lieut. R. S. Carroll, Special Reserve; May 14th, 1916. May 15th, 1916: Lieut. H. H. Balfour, K.R. Rif. Corps, Special Reserve, from 10th K.R. Rif. Corps. Second Lieut. G. D. F. Keddie, London R. (T.F.); Second Lieut. H. M. Probyn, R. War. R. (T.F.); Temporary Second Lieut. D. V. Armstrong, General List. Second Lieut. (on probation) V. M. C. B. de Savigny, York and Lanc. R., Special Reserve, and to be seconded; May 16th, 1916. *From Flying Officers (Observers).*—May 15th, 1916: Lieut. F. W. H. Simpson, R.A.; Temporary Second Lieut. H. C. Hopkinson, General List.

Flying Officers (Observers).—April 1st, 1916: Second Lieut. (Temporary Lieut.) H. G. Thornton, Northern R. (T.F.); Temporary Second Lieut. H. Hamer, N. Lan. R., and to be transferred to the General List; Second Lieut. D. H. de Burgh, R.A., and to be seconded; Second Lieut. W. S. Caster, Hunts. Cyclist Bn. (T.F.); Second Lieut. (on probation) P. W. Spurr, R. Berks. R., Special Reserve and to be seconded; Temporary Second Lieut. H. L. Lascelles, York R., and to be transferred to the General List. April 28th, 1916: Second Lieut. (Temporary Lieut.) D. C. Beck, R.A. (T.F.); Second Lieut. J. A. Williamson, R.E. Kent Yeo. (T.F.); Second Lieut. A. G. A. Davis, Devon. R., and to be seconded; May 14th, 1916.

Assistant Equipment Officer.—The appointment of Temporary Second Lieut. J. L. Miles, General List, is antedated to Jan. 27th, 1916.

Supplementary to Regular Corps.—Second Lieutenants to be Lieutenants; May 1st, 1916: G. O. Hayne, W. E. Collison, J. E. Marriott, P. D. Robinson, H. E. van Goethem, D. A. L. Davidson, F. W. Stent.

Second Lieut. (on probation) C. J. Q. Brand is confirmed in his rank.

The following appeared in the *London Gazette* of the 2nd inst. :—

Flight-Commanders, from Flying Officers.—Lieut. F. W. H. Simpson, R.A., and to be Temporary Captain whilst so employed; May 16th, 1916. Lieut. (Temporary Capt.) G. W. Rice, R.A. (T.F.), and to retain his temporary rank whilst so employed; May 23rd, 1916.

Wing-Adjutant, and to be Temporary Captain whilst so employed.—Lieut. C. S. McNab, Cam'n Highrs.; April 8th, 1916.

Second Lieut. B. E. Sutton, West. and Cumb. Yeo. (T.F.), from a Flying Officer (Observer); May 6th, 1916. Lieut. R. H. Jerman, R. W. Fus., and to be seconded, vice Capt. H. M. Meyler, Bord. R., May 7th, 1916.

Supplementary to Regular Corps.—Second Lieut. (on probation) C. T. L. Millington relinquishes his commission; May 13th, 1916.

Second Lieutenants (on probation) are confirmed in their rank: A. T. Thompson, A. N. Patterson, E. D. L. Davies, H. L. Saunders and C. R. Fry.

The following appeared in a supplement to the *London Gazette* issued on the 3rd inst. :—

The appointment of Second Lieut. W. G. Stewart, Special Reserve, as a Flying Officer is antedated to May 3rd, 1916.

Memoranda.—Temporary Capt. C. D. M. Campbell, R.F.C., Special Reserve, to be Temporary Major (without the pay or allowances of that rank) whilst specially employed; May 18th, 1916.

Pte. Reginald B. Mellor, from H.A.C. (T.F.), to be Temporary Second Lieutenant for duty with the R.F.C.; May 27th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: G. H. Armstrong, R. M. W. Browne, A. J. Hamar, D. Cloete, R. Buck, H. B. Prior, and G. F. Golding.

Second Lieut. (on probation), Samuel Pope is removed from the Army, the King having no further occasion for his services; June 4th, 1916.

The following appeared in a supplement to the *London Gazette* issued on the 5th inst. :—

Flying Officer (Observer).—Lieut. M. D. G. Scott, N. Lan. R., Special Reserve, and to be seconded. May 21st, 1916.

CONSTRUCTIONAL DETAILS—XIV.*

WHILE a very great variety of engine mountings, and especially cowlings on tractor machines, are available for illustrating typical examples of general practice, we have found it more difficult to compile a set of engine mountings and housings of "pusher" machines. From our extensive collection of material it has been impossible to find more than the few examples shown that are representative of current practice, a fact which appears to indicate a lack of application of ingenuity to the mounting of rotary engines in this type of aeroplane. Whether this is due to the fact that the tractor machine had, before the war, been found to possess greater possibilities as regards performance, and therefore was more highly developed, it is difficult to say, but the fact remains that, as we have said, the problem of mounting and housing an engine on a propeller biplane presents an aspect of sameness which leads one to conclude that there must be some reason why so little has been attempted in this respect; either the stream-lining of an engine is less important in a "pusher," or its accomplishment is a matter of greater difficulty than in the tractor.

Let us examine the first case and see if there is any reason for supposing that a good streamline casing around the engine of a propeller biplane is of less importance than in the case of the engine mounted in the nose of a *fuselage* tractor. From experiments on struts and similar streamline bodies it has been found that truncating the tail does not have a very serious effect on the resistance, until it reaches a certain point, after which further truncation increases the diameter of the "dead" region, and the resistance goes up at a comparatively rapid rate. This would appear to indicate that a rotary engine mounted on the extreme rear of a *nacelle* would present a flat surface of sufficient area to cause a dead water region of considerable magnitude, which would cause a perceptible increase in the resistance of the *nacelle*, and it cannot, therefore, be argued, we think, that the stream-lining of the engine is of less importance in this type of machine than in a tractor.

Turning now to the question of practical considerations for a clue to the reasons for the apparent lack of attempts at stream-lining the engine on a "pusher," it should be realised that whereas the nose, and consequently the cowl, of a *fuselage* can be kept comparatively blunt without adding very materially to the resistance, the tail of a streamline body should, as we have just pointed out, at least be considerably more pointed to give the best results. It will be easily seen that when the engine is placed in the rear, a cowl entirely enclosing it will necessitate a very wide *nacelle*, to which it will be difficult to impart a good shape. The other alternative would be to so arrange the mounting that only the outer ends of the cylinders of the rotating engine projected outside the *nacelle*. In this case the normal surface presented by the cylinders would, of course, tend to offer a very considerable amount of resistance, but it should be borne in mind that whatever happens the importance of sufficient cooling is far greater than that of saving a pound or two in resistance. Judging from such recent examples of high speed "pushers" as the Pemberton Billing "Sparklet" and the de Havilland scout, both of which have been produced during the war, and illustrations of which must not, therefore, be published at present, the method of having the ends of the cylinders projecting beyond the sides of the *nacelle* is not detrimental to great velocities. On the other

hand, in both of these machines it would appear probable that an even better speed could be obtained by adding to the crankcase a conical aluminium tailpiece mounted on and revolving with the engine, and serving to decrease the diameter of the "dead" region caused by the comparatively flat surfaces of the crankcase, propeller boss and inner ends of the propeller blades.

Reverting to the illustrations of mountings and cowlings in use before the war, that of the H. Farman will be dealt with first, since this machine has served as the prototype of all "pushers." Owing to the comparatively shallow depth of the H. Farman *nacelle* and to the placing of the latter down on top of the lower wing it has been necessary, in order to bring the centre of thrust into coincidence with the centre of resistance, to raise the engine slightly above the upper *longerons* of the *nacelle*. This is accomplished in the H. Farman by mounting the engine on two pressed steel bearers of the shape shown in the illustration, one of which is placed fairly close against the front cover of the crankcase, while the second is situated further forward and supports the front end of the crankshaft. The engine, it will be seen, is hung cantilever fashion, a method which at one time was, and still is by some designers, thought unsatisfactory, but which is, nevertheless, very frequently employed without, apparently, any serious disadvantage. Another form of mounting is shown in the sketch of the Nieuport-Dunne biplane, which was exhibited at the last Paris Aero Salon. Here the engine is overhung as in the case of the Farman, but instead of the pressed steel bearers resting on the upper rails only they are attached, in this machine, to both upper and lower rails of the *nacelle*.

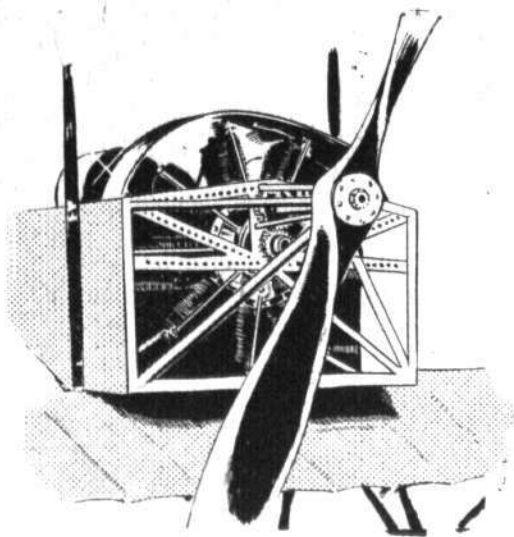
In the Caudron propeller seaplane the rotary engine was mounted between two bearers, the shape of which can be seen in the illustration, and the drive, it will be noticed, was through spur reduction gearing. We now come to the only two examples we have been able to discover of engines enclosed in aluminium cowlings. One of these is the Avro biplane exhibited at the last Olympia show, and the other the Grahame-White biplane on view at the same time. In the Avro the engine was mounted between double bearers, the front one of which was of the ordinary pressed steel type, while the rear one consisted of a ball-race supported on four tubular extensions of the *nacelle longerons*. Air was admitted to the cowl through a scoop on top of the *nacelle*, and was allowed to escape by way of the open lower portion of the housing.

In the Grahame-White "pusher" the engine was mounted on three bearers, one of which was adjustable in a vertical sense, while the second was self-aligning. The drive was through chain and sprockets, and the propeller mounted on a shaft carried in bearings in the manner shown in the illustration. The lower part of the cowl was left open, and air was admitted to the housing from underneath instead of from above, as was

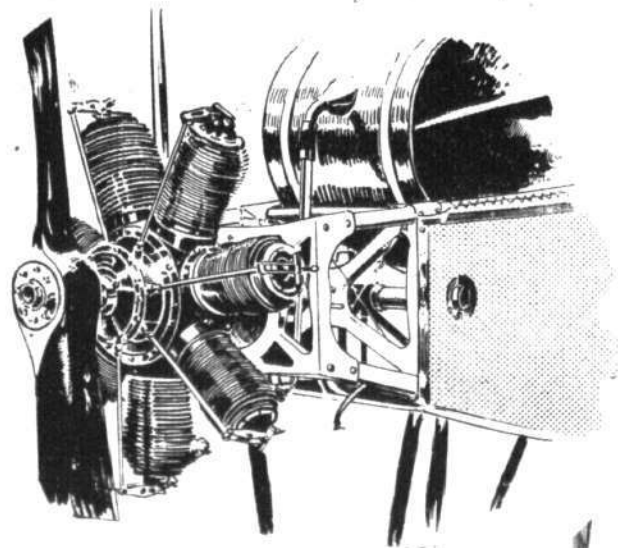
* Previous sets of sketches in this series have appeared as follows:

Strut sockets	...	Sep. 10	Single-skid undercarriages	Oct. 26
" "	...	" 17	Vee type undercarriages	Nov. 5
" "	...	" 24	" " " "	" 12
" connections, &c.	...	Oct. 1	Wheel undercarriages	" 19
Wing spar sections	...	" 8		1916
Streamline struts, sections	" 15		Engine mountings	Jan. 6
Double-skid undercarriages	" 22		" "	Apr. 27

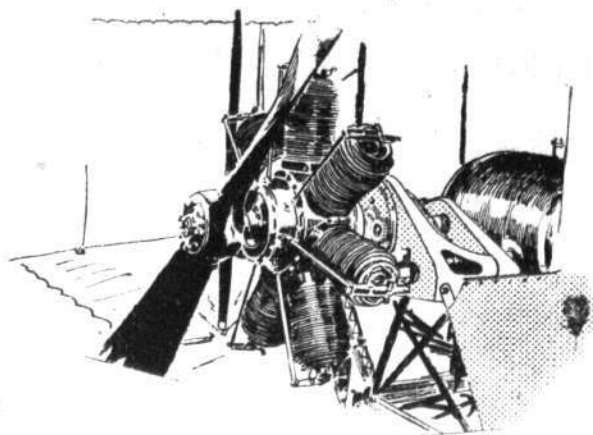
Any of these back numbers can be obtained from "FLIGHT" Office, 44, St. Martin's Lane, price 6d. each, post free.



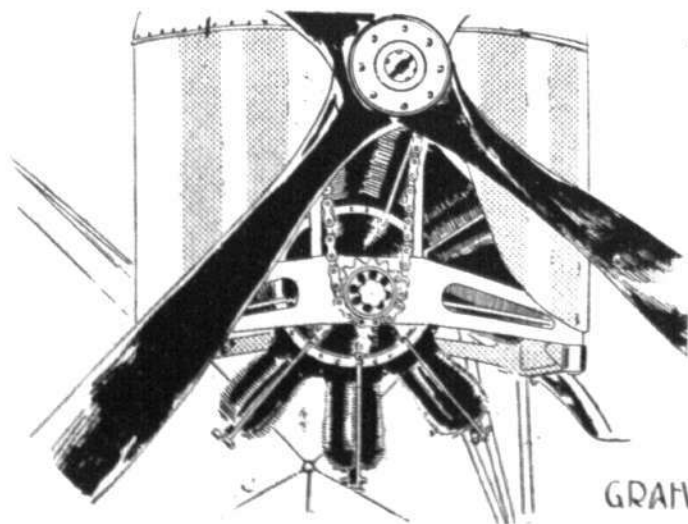
CAUDRON



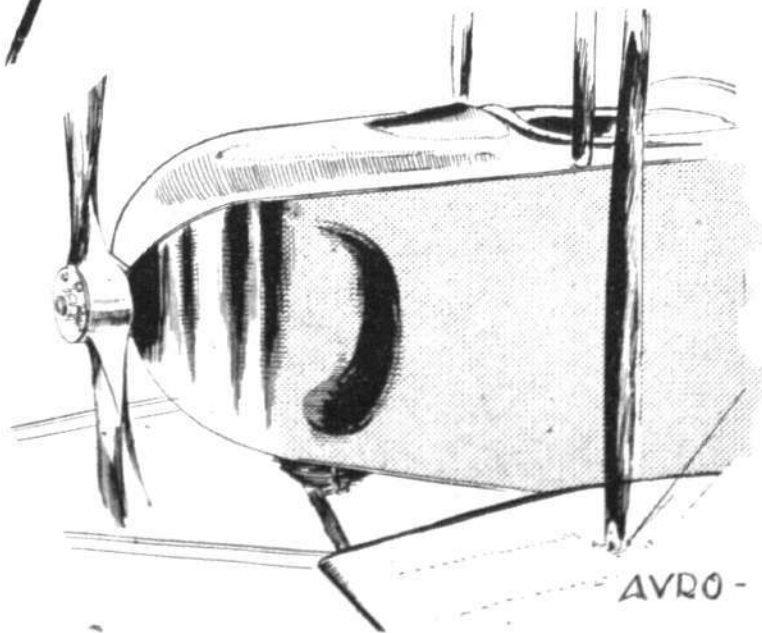
NIUPOORT-DUNNE



H. FARMAN



GRAHAM-WHITE

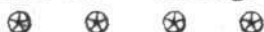


AVRO-

Some engine mountings and housings on "pusher" biplanes.

the case with the Avro biplane. From an external inspection of the whole *nacelle* of this machine, one received the impression that it was of streamline form, but flying "wrong end on," that is to say, with its pointed end facing forward and its blunt end at the rear. This was not the case in reality, however, for the flow of the air over the bottom of the *nacelle* and into the cowl was

following a different path from that indicated by the outline of the *nacelle*. It would appear probable, that the rear vertical portion of the cowl offered a considerable amount of resistance, and neither this nor the Avro machine were ever proved very successful, although it is not quite certain whether this was due to the engine housings or to other causes.



The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Regulations for Civilian Flying Schools Approved by the Royal Aero Club.

THE Committee at its Meeting on May 24th, 1916, drew up the following Regulations for the running of Civilian Flying Schools, and it was decided that any School undertaking to conform with these Regulations would be placed upon a list of Schools approved by the Club.

The intention is to ensure a definite standard of tuition up to the period of obtaining an Aviator's Certificate.

Anyone wishing to adopt the Regulations or requiring further information should communicate with the Club.

Regulations.

1. Every instructor shall have obtained an F.A.I. Aviator's Certificate and shall have been fifteen hours in the air in control of a machine, after obtaining his certificate.
2. The maximum number of pupils for each machine in flying condition shall be six.
3. The maximum number of pupils for each instructor shall be eight.
4. The minimum proportion of reserve machines to replace those undergoing repair shall be one for every three in use.
5. The minimum time a pupil shall be in the air in the aggregate before making the necessary flights for an Aviator's Certificate shall be five hours, of which at least two hours shall be solo.
6. All Schools shall keep a register of pupils under instruction, and a book giving full particulars of all flights made by them, which shall be open to inspection at any time without notice by officials of the Royal Aero Club appointed for that purpose.
7. The Flying Ground shall be kept clear while a pupil is carrying out the tests for an Aviator's Certificate, and each school shall undertake not to allow any of its pupils to fly while a pupil of another school is carrying out the tests for a Certificate.
8. Particulars of all breakages and repairs to machines shall be kept in a book provided for that purpose, which shall be open to inspection by the officials of the Royal Aero Club.

9. The "Rules of the Air," as set out in the Competition Rules of the Royal Aero Club, shall be observed by all pupils.

10. Machines used for instructional purposes shall be inspected frequently by an instructor during the day's work, and always after a bad landing, and by a competent mechanic each day.

11. All machines shall be inspected at any time without notice by an independent inspector appointed by the Royal Aero Club.

12. Disputes between pupils and schools shall be submitted to arbitration by the Royal Aero Club.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.		£	s.	d.
Total subscriptions received to May 30th, 1916	10,686	9	5	
Collected at the Westland Aircraft Works, Yeovil (Thirty-fourth contribution)...		0	13	9
Staff and Workers of Gwynnes, Ltd. (Sixteenth Contribution) ...		8	8	0
Total, June 6th, 1916	10,695	11	2	

B. STEVENSON, Assistant Secretary.
166, Piccadilly, W.

Roll of Honour.

THE Secretary of the Admiralty announces the following casualties:—

Under date May 31st: **Died.**
Flight Sub-Lieutenant Leonard W. Hodge, R.N.

Previously reported Missing, now reported Killed.
Flight Sub-Lieutenant Cecil R. Terraneau, R.N.

The following casualties have been officially announced by the War Office:—

Killed.
Captain E. W. Barrett, Royal Flying Corps.
Second Lieutenant L. C. Powell, R. Scots. Fus., attached R.F.C.

Previously reported Missing, now reported Killed.
Captain C. Bruno, Royal Flying Corps.
Second Lieutenant B. E. Glover, Royal Flying Corps.
Lieutenant G. D. G. Grune, R.F.A. and R.F.C.

Previously Officially reported Missing, now Unofficially reported Killed.
Lieutenant M. D. Basden, London Regt. and R.F.C.

Wounded.

Captain C. Mackay, Leinster Regt. and R.F.C.
Lieutenant J. C. Slessor, Royal Flying Corps.
5598 2nd Class Air-Mechanic G. B. Batchelor, Royal Flying Corps.

Missing.

Second Lieutenant A. Cairnduff, R. Munster Fus. and R.F.C.
Second Lieutenant G. Maxwell, Royal Flying Corps.
1840 Corporal D. McMaster, Royal Flying Corps.

Fatal Accidents.

INQUESTS were held at Upavon on May 31st on Lieut. E. le Sauvage, 2nd Class Air-Mechanic W. J. Woodland, Flight Sergeant E. G. West, and 2nd Class Air-Mechanic W. Burlinson. It was stated that both pilots were experienced. A verdict of "Accidental Death" was returned in each case.

With regard to the accident in which Capt. Grime Jones was killed, as recorded in our last issue, the following note was issued by the War Office on June 2nd:—

"With reference to various published statements on the subject, it is notified that the machine which Lieutenant Tennant was flying at the time of the recent accident was a B.E. 2C. Lieutenant Tennant was the pilot."

BIRTHDAY HONOURS FOR THE R.F.C.

In the list of honours published, on the occasion of His Majesty's birthday, in the *London Gazette* of the 2nd inst., there were the following:—

The King has been graciously pleased to give directions for the following appointment to the Most Distinguished Order of Saint Michael and Saint George, for valuable services rendered in connection with the war:—

Third Class, or Companion.

Major (Temporary Lieutenant-Colonel) LIONEL R. O. CHARLTON, D.S.O., Lancashire Fusiliers and R.F.C.

His Majesty the King has been graciously pleased to approve of the undermentioned promotions for valuable services rendered in connection with the war, with effect from June 3rd, 1916, inclusive:—

To be Brevet Lieutenant-Colonels.

Major (Temporary Lieutenant-Colonel) E. M. MAITLAND, Essex Regt.

Major (Temporary Lieutenant-Colonel) W. W. WARNER, R.F.C., late Indian Army (on retired list).

To be Brevet Major.

Captain (temporary Lieutenant-Colonel) R. K. BAGNALL-WILD, late R.E. (on retired list).

His Majesty the King has been graciously pleased to approve of the undermentioned rewards for distinguished service in the field, dated June 3rd, 1916:—

Promotions.

To be Brevet Lieutenant-Colonels.

Major (Temporary Lieutenant-Colonel) H. R. M. BROOKE-POPHAM, D.S.O., Oxford and Bucks L.I. and R.F.C.

Major (Temporary Brigadier-General) J. M. SALMOND, D.S.O. Royal Lancaster Regt. and R.F.C.

Major (Temporary Lieutenant-Colonel) W. G. H. SALMOND, R.A. and R.F.C.

Distinguished Service Order.

Captain and Brevet Major S. D. MASSY, Royal Flying Corps, Indian Army.

Captain and Brevet Major ARTHUR J. ROSS, R.E. and R.F.C.

Military Cross.

Captain GEORGE W. D. ALLEN, Liverpool Regt., Special Reserve, and R.F.C.

Second Lieutenant (Temporary Captain) PHILIP BABINGTON, Hampshire Regt. (T.F.) and R.F.C.

Captain (Temporary Major) A. C. BOLTON, Royal Scots Fusiliers and R.F.C.

Captain M. G. CHRISTIE, Royal Flying Corps, Special Reserve.

Lieutenant (Temporary Captain) J. P. C. COOPER, Royal Flying Corps, Special Reserve.

Second Lieutenant F. E. GOODRICH, Royal Flying Corps, Special Reserve.

Second Lieutenant (Temporary Captain) J. H. HERRING, Royal Flying Corps, Special Reserve.

Captain (Temporary Major) THOMAS O'BRIEN HUBBARD, Royal Flying Corps, Special Reserve.

Captain LEOLINE JENKINS, R.G.A. (T.F.) and R.F.C.

Lieutenant (Temporary Captain) L. W. LEARMOUNT, Royal Flying Corps, Special Reserve.

Lieutenant (Temporary Captain) BASIL C. MCEWEN, Royal Flying Corps (Special Reserve).

Captain ALFRED G. MOORE, Special Reserve, Manchester Regt., attached R.F.C.

Captain (Temporary Lieutenant-Colonel) CYRIL F. DE SALES MURPHY, Royal Berks Regt. and R.F.C.

Lieutenant (Temporary Captain) L. A. PATTINSON, Royal Fusiliers and R.F.C.

Captain (Temporary Major) T. V. SMITH, Royal Flying Corps, Special Reserve.

Second Lieutenant WILLIAM V. STRUGNELL, Hampshire Regt. and R.F.C.

Lieutenant (Temporary Captain) HELPERUS A. VAN RYNEVELD, Royal Flying Corps.

Captain LORD GEORGE WELLESLEY, Grenadier Guards and R.F.C.

Second Lieutenant (Temporary Captain) W. G. BRANSHY WILLIAMS, Royal Flying Corps, Special Reserve.

Distinguished Conduct Medal.

Flight-Sergeant H. G. DADLEY, Royal Flying Corps.

68403 Sergeant W. J. FORDHAM, R.H.A., attached 14th Anti-Aircraft Section.

88053 Gunner G. W. G. MARSHALL, R.H.A., attached 14th Anti-Aircraft Section.

1776 Flight-Sergeant (acting S.-M.) H. MCKENNA, Royal Flying Corps.

8558 Sergeant E. TROWBRIDGE, R.H.A. (attached 20th Anti-Aircraft Battery).

Military Medal.

299 Flight-Sergeant (Acting Sergeant-Major) J. BELL, R.F.C.

1857 Sergeant S. BULL, Royal Flying Corps.

116 Flight-Sergeant (acting S.-M.) H. C. S. BULLOCK, R.F.C.

39677 Sergeant G. W. F. H. DOWNER, R.H.A., attached 14th Anti-Aircraft Section.

7911 2nd Class Air-Mechanic H. N. FARMER, R.F.C.

7500 2nd Class Air-Mechanic A. J. GREATORREX, R.F.C.

320 Flight-Sergeant (acting S.-M.) H. JAMES, R.F.C.

54 Flight-Sergeant (acting S.-M.) J. C. JONES, R.F.C.

346 Flight-Sergeant (acting S.-M.) M. KEEGAN, R.F.C.

422 Flight-Sergeant (acting S.-M.) C. LITTLEJOHN, R.F.C.

276 Flight-Sergeant M. WEARE, R.F.C.

FROM THE BRITISH FLYING GROUNDS.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Straights with instructor last week: Messrs. Welinkar, Ballard, Bathurst, Donald, Ward, Edwards, Kayes, Phillips, Cooper, Goodhart, Cockelle and Forster. Circuits with instructor: Messrs. De Beer and Turner. Eights with instructor: Mr. Smith. Landing practice: Messrs. Rabourdin and Sloden.

Brevet during week: Mr. Spencer.

Beatty School.—The following pupils were out during last week: Messrs. le Champion, Gliksten, Atkin, Drewery, Barrow, Martin, Roberts, Knox, Brewerton, Phillips, Stanley, Dowding, Davy, Gaskin, Hoskins, Earl, Skeet, Kay, Edwards, New, Jones, Whitmore, Garlick, McPherson, Mitchell, Venables, Towson, Elliott and Austen.

The instructors were Messrs. G. W. Beatty, G. Virgilio, A. E. Mitchell and H. Fawcett; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron dual-control and single-seater tractor biplanes.

Hall School.—The following pupils were out last week receiving instruction: With P. G. Allen: Skinner, Russell, Jones, Guy, Illingworth, Corder, and Davis. With Charles Bell: Deane, Dickson, Gudger, Skinner, Collier, Worswick, and Rand. With Cecil M. Hill: Taylor, Rochford, Worswick, Rand, Gaskell, Jones, and Guy.

Machines in use: Hall and Caudron Government type tractors.

Certificate were taken by Taylor and Rochford. Both of these pupils took their certificates at an average height of 1,000 ft., and faultless *vol planés* from 2,000 ft. with well-judged landings. These *brevet* tests were taken on 70 h.p. Isaacson Hall-Caudron tractor biplane fitted with 90 Curtiss "Ebora" propeller.

London and Provincial Aviation Co.—Pupils rolling last week: Messrs. Sivewright, Daly and Evernden. Doing straights: Messrs. Rimer, Dawson, Jones, Birkbeck, Whittingham, Lieut. Deacon and Capt. Nathan. Circuits and eights: Messrs. Moore, Pulford and Brake.

Instructors: Messrs. W. T. Warren, M. G. Smiles, F. G. Parsons and W. T. Warren, jun.

Royal Aero Club Certificates were taken by Messrs. F. Moore, L. Pulford and L. H. Brake.

During the month of May thirteen Royal Aero Club Certificates were secured.

Ruffy-Baumann School.—Pupils with instructor last week: Messrs. Carr, Edgar, Wilson, Dobson, Portella, Maya, Torres, Di Balme, Bailey, Straus, Fanshawe, Westlake, Williams and Fraser. Straights or rolling alone: Messrs. Bailey, Williams, Winter, Fraser, Hoskyns and Whitaker. Eights or circuits alone: Messrs. Straus, Portella and Baron D'Opstael.

Instructors: Messrs. Ed. Baumann, Felix Ruffy, Ami Baumann, Andre Thomsen and Clarence Winchester.

50 and 60 h.p. Ruffy-Baumann tractor biplanes in use.

Certificates taken by Baron D'Opstael, G. Straus and

M. Portella, the last-named making an exceptionally good series of flights.

Bournemouth School.

PUPILS rolling alone last week: Messrs. Kennedy, Pritt, Scaramanga, Daniel, Green, Brandon, Turner, Little, Hammersley and Hinchliff. Doing straights alone: Messrs. O. Wilson, J. Wilson, Gordinne, Smith, Adamson and Barlow. Half circuits alone: Messrs. Gordinne, Morris and O. Wilson. Eights and circuits alone: Mr. C. Gordinne.

Instructors: Messrs. S. Summerfield and Brynildsen; 35 h.p., 45 h.p., and 60 h.p. Caudrons in use.

Certificate was taken by Mr. C. Gordinne, whose flying was very good.

During the week several passengers enjoyed flights by Mr. S. Summerfield on the 60 h.p. Caudron.



CLASSES FOR TRAINING MUNITION WORKERS.

CONDUCTED AT REQUEST OF THE MINISTRY OF MUNITIONS BY THE LONDON COUNTY COUNCIL AND AT OTHER CENTRES.

THE following is a summary of the accommodation for the purposes of training as installed at School of Building, Ferndale Road, Clapham.

This admirable scheme is dealt with in our Leader this week.

The workshops are accommodated in a hall 150 ft. by 70 ft., of which 100 ft. is used for machine and fitting shops. The lay out is complete with the necessary offices, stores, refreshment rooms, machine, fitting and blacksmith shops. The organisation follows as nearly as possible that of a munition factory, hence the manufacture of actual details of munitions is undertaken.

In July, 1915, the following equipment was installed:—30 lathes, 11 drilling machines, 3 power hack saws, 2 shaping machines, 1 punching machine, 1 shearing machine, and 45 vices.

The following machines have since been added:—6 capstan lathes, 12 milling machines (including profiling machines), 3 lathes for 18-pounder cartridge cases, 2 turret lathes for 18-pounder shells, 2 tool grinders, 2 Universal cutter grinders, and 1 slotting machine.

The following machines are on order, but have not yet been delivered:—8 milling machines (including profiling machines), 5 lathes (including 3 capstans), 1 two-spindle drilling machine, and 1 power hack saw.

There are three main lines of shafting, each about 100 ft. long, driven by 4 electric motors.

Two definite classes of workers are trained: (a) Ordinary operators at the vice and machine tools; (b) Tool setters on lathes, milling and allied machines.

Set schemes are worked to, excepting where special requisition is made by individual firms for workpeople to meet individual needs.

All tool setters and practically all the operators have been placed in munition factories.

Return of Training of Students from July, 1915, up to Saturday, May 20th, 1916.

Brixton School of Building (originally conducted at Beaufoy Institute)	General Course from July, 1915, and Tool Setting from February, 1916.
Shoreditch Technical Institute	... General Course from July, 1915.



FLYING AT HENDON.

As the early part of last Saturday afternoon was somewhat windy and showery, it was not until later that conditions were favourable for flying. The first machine away was a new 60 h.p. G.-W. biplane, of a similar type to the 80 h.p. three-seater, but having only two seats and fitted with dual control. It was piloted by C. Pashley, and carried a naval observer as passenger. They were up for some time, reaching an altitude of several thousand feet. M. Osipenko came out next on one of the 60 h.p. school 'buses, upon which he put up some of the best steeply-banked spirals for this type of machine that have been seen at Hendon for some time. Now and again he also indulged in a few switchbacks. In the meanwhile one of the 80 h.p. three-seaters was brought out, and J. S. B. Winter, H. C. Biard, and B. F. Hale got going with passengers.

Poplar School of Engineering	... General Course from September, 1915.
Brixton School of Building	... Lead Burning from November, 1915.
Goldsmiths' College	... Gauge Making from March, 1916.
South-Western Polytechnic	...

	General Course.	Lead Burning.	Tool Setters.	Gauge Makers.	Total.
Number in attendance during week ended 20.5.16	501	38	36	36	611
Number certificated up to 20.5.16	2,897	75	38	28	3,038
Number refused certificates and withdrawn	936	26	1	11	974
Certificated—					
Number known to have entered factories or H.M. Forces	2,564	75	37	27	2,703
Number unplaced	333	—	1	1	335
Uncertificated. Number known to have entered factories	76	—	—	—	76
Second and subsequent placings	76	2	2	—	80

The Centres at which training is given run from 9 a.m. to 1 p.m., 2 p.m. to 6 p.m., and 6.30 p.m. to 10.30 p.m., from Monday to Saturday inclusive, i.e., 72 hours per week. Each student is required to attend 4 hours daily.

In Gauge-making Centres, instruction is given for 44 hours per week.

Students have been supplied to 338 individual firms, one of which has taken 344 students. 18 firms have taken over 20 students each.

Women Tracers.—Included in the number of students placed in factories are 46 women who have been trained as tracers.

10,800 applications have been registered apart from those whose applications have been declined.

Marcus D. Manton, who has had several weeks' severe illness, made a welcome reappearance, and put in about four flights on the G.-W. 'buses. A Curtiss tractor made a high flight, finishing with a fine spiral descent, and a Sopwith bullet and a two-seater de Havilland pusher left for destinations unknown. H. Sykes also came out on a two-seater Martinsyde, but some slight damage caused by the long grass he was unfortunate enough to get amongst after landing brought his demonstrations to a premature end. Later in the evening the various schools got going.

On Sunday wind and rain put a stop to all proceedings. The usual exhibition and passenger flights will be given this Whitsun—Saturday, Sunday and Monday—so that if anyone is taking a "holiday as usual" they will be catered for at Hendon just the same.

THE FOURTH WILBUR WRIGHT MEMORIAL LECTURE.

In view of the present conditions it was not thought desirable to adhere to the usual scientific character of the Wilbur Wright Memorial Lecture, as publication of the results of new research would be unwise, but for all that the paper read by Mr. Griffith Brewer on the 6th inst. before members of the Aeronautical Society of Great Britain at the Royal Society of Arts, John Street, Adelphi, Strand, was no less interesting, having for its subject the life and work of Wilbur Wright. So great has become the importance of the Flying Services that it was most appropriate that this year's lecture should deal with the work of the great pioneer in whose honour the Memorial Fund was created, and the collection into one volume of facts and various articles bearing upon the life-work of the Wright brothers must have been a pleasant labour of love for the author.

Lord Montagu presided at the meeting, and among the other speakers were Lord Northcliffe, who seconded the vote of thanks to Mr. Griffith Brewer, Major-General R. M. Ruck, who proposed a vote of thanks to the Chairman, and Brigadier-General F. G. Stone, who seconded it.

Much of the contents of Mr. Griffith Brewer's paper is known to our readers, having appeared from time to time in various forms in our journal, but several facts emerge, some of which are not generally known, whilst others have never previously been published. For instance, it was not generally known that Wilbur Wright in his early days did a considerable amount of journalistic work, showing a talent which would, as the lecturer put it, "have taken him far with his pen had not the air claimed him for greater work." It has been said on occasions that the Wright brothers were not scientists, whereas as a matter of fact they did do, as early as 1901, an immense amount of scientific research work, building a wind tunnel 16 ins. square, in which were tested more than two hundred model wing sections, the lift and drift of which were ascertained in this way. So thorough a grasp did the brothers have of their subject that their wind tunnel, although possibly not being so accurate as more recent ones, embodied all the characteristics of tunnels in use at modern laboratories.

Regarding the gliding experiments that preceded the

flights on a power-driven machine little need be said here, as the history of these is well known.

In conclusion, the lecturer pointed out that one should not allot any portion of the great discovery to one or other of the brothers. "It required," he said, "two brains working in unison, two lives, one to be risked while the other watched, two purposes placed before all thoughts of gain or pleasure, to accomplish that which those brothers did for posterity. We therefore honour Wilbur, knowing that he will hand half of that honour to 'Brother Orv.'"

In some appendices further light is thrown on the personalities of the great pioneer. The first contains an article written by Wilbur, and published in the Wrights' paper *Snap Shots*, in which he defends, with the wit and sarcasm familiar to those of us who knew Wilbur Wright in France, a critic who had ventured to criticise the action of four members of a local authority, who were bringing four actions for libel against the local critic of their public work. A second appendix contains a lecture given by Mr. Wilbur Wright to the Western Society of Engineers. This lecture is already well known. A third appendix consists of a letter written by Mr. Harvey M. Weaver to Mr. Lahm, in Paris, giving an excellent account of the performances of the "Wright flyer" at the end of 1905. Another appendix is a reprint of an article written jointly by Orville and Wilbur and published in the *Century Magazine*, September, 1908, giving a popular account of their experiments. A fine tribute to Mouillard, written by Wilbur Wright and published in *The Aero Club of America Bulletin*, April, 1912, forms yet another appendix, while following this is one in which Wilbur Wright refutes the claim made that Ader was the first man to fly. This is of historical value, as it is a not uncommon occurrence to find writers of aviation books, who are not too careful as to facts, still quoting Ader as being first.

The last appendix is, perhaps, the most interesting of all, giving, as it does, the evidence of Wilbur Wright in the patent action in America, in which he describes in his own clear concise manner how he and his brother Orville succeeded in producing the first aeroplane to fly. This description has not been published before.

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A German reconnaissance biplane brought down practically uninjured at Salonica.

AVIATION IN PARLIAMENT.

MR. LEMBERTON BILLING, speaking on June 1st on the motion for the adjournment of the House of Commons for the Whitsuntide recess, said that he regretted that in the criticism in the House generally on the question of the air there had been a considerable amount of heat generated, which perhaps was not altogether necessary. But he thought it his duty in that House and elsewhere, in view of the fact that he had left a combatant force to go there. Certain things had happened since his arrival, and certain reforms had taken place. He took that opportunity of congratulating the Government on the steps, though not, in his opinion, very vigorous steps, but at least they had wandered in the right direction. They had had a Committee formed by the Government, and they had had a Committee of Inquiry. He still very strongly took exception to both the composition and terms of reference of the Committee of Inquiry, but he thought his duty was plain. If it was his intention, as he would like the House to understand it was, to serve the Air Service rather than any advancement of himself in the House or outside, it was obviously his duty to appear before that Committee no matter how he might take exception to it, to try and give them all the benefit of the knowledge he had of the inefficiency of the Air Service and allow them to be the judge of what reforms were necessary. He thought a very useful purpose would be served if a member of the Air Board as distinct from the Air Committee were in attendance upon the meetings of that Air Committee, so that the Air Board might have first hand information as to such evidence and information as was tendered to enable it to bring about reforms which they were all very anxious, some of them more than others, to see brought about in the Air Service generally, both in the naval and military branches. He proposed, as far as that Board was concerned, to refrain from criticising it in any way whatsoever. He quite appreciated that Lord Curzon had undertaken a task of very great magnitude, and he would have around him a multitude of counsellors, all most willing and anxious for many reasons, and not in every case for the same reasons, to advise and assist him in every way they could. He could only say that any assistance or advice that he could give he would be very pleased to render. His criticism he had always tried, except in some moments, to make constructive. Within the last two months, for some reason or another—he had no need to say for what reason—they had been very fortunate in the reforms which had taken place in the Air Services. Aerodromes which were unsuitably lighted were now suitably lighted. Aeroplanes which were dangerous to fly with had been substituted by better machines. In fact, generally during the last two months he thought he could say without fear of contradiction, unless perhaps it were official contradiction, that there have been more reforms carried out both in our naval and military flying service than had been carried out in the previous two years. That, at least, was satisfactory, and he congratulated the departments on the work which they had accomplished. He would like to point out that there was still room for careful administration in some of the aerodromes. He did not wish to suggest that the five or six officers who have been killed in the past two or three days directly reflected on that point. He must, however, call attention to a point to which it was exceeding painful to refer to. Despite any passage-of-arms he might have had across the floor of the House, there was no man in the House who at the moment sympathised more deeply than he did with the Under-Secretary of State for War in the recent accident to his son. He would be the last to fail to understand what that meant to the right hon. gentleman. He read in the *Times* the account of the accident, which he believed was described thus:

"A fatal aeroplane accident occurred yesterday in Kent. A military biplane had descended and was rising for the return journey, when it was caught by the wind, and sideslipped at the height of 120 ft., falling nose downwards. The pilot, Captain George Alfred Grime Jones, was killed, and the observer, Second Lieutenant Tennant, was seriously injured."

Knowing the type of machine, that it was a B 2 C No. 4335, and, in view of his remarks more particularly applying to that type of machine, and the fact of the machine falling 120 ft. with a sideslip and a nose dive, he could hardly believe that the one who was killed was the pilot. He did not know a more regrettable accident which had taken place to this type of machine, which, as he had said before, had a habit of being under-powered. It had never come to his knowledge that the pilot had been killed and the passenger only injured. He only, therefore, proposed to ask whether that was so. Before taking any steps, he received two letters from people interested in Captain Grime Jones, asking him to call attention to the fact that these newspaper reports, which he understood had been released by the Press Bureau, were wrong. Captain Grime Jones was not the pilot. It was rather hard that the man who was not responsible for that accident, and was killed, should be accused of it. He had reason to believe that

it was Lieut. Tennant, who was a probationer, without experience, and—it was stated in a letter from a very responsible party—was the last officer who could be trusted at that time to fly with a passenger. Neither of them had any experience when this regrettable accident occurred. He did not propose to criticise now—it was too delicate a question.

But he considered it his duty, with the information in his hand, to make that statement in public that Captain Grime Jones was not the pilot, neither was he in any way responsible for the accident, nor for his own death. It was incidents like that which made them feel that there was all the more reason why the very greatest care and discipline should be exercised where these young fellows were concerned in their early days of piloting. He had not accurate figures, but he thought that, according to the percentage of pilots killed in tuition, the civilian schools compared very favourably with the military schools, numbers for numbers. He asked the representative of the Air Board to represent to his Board the necessity—and he trusted they had the power—of watching very carefully the types of machines which were being employed and the types of machines which it was contemplated were going to be ordered. Every day, and more especially just about now, very large orders would be given both for engines and aeroplanes, and on the type that was ordered there depended to a very great deal not only the lives of the men who would be called upon to fly them, but possibly the orders which would be given now would bring the machines due for delivery at a moment when we should need them most.

He asked the representative of the Board to impress upon Lord Curzon the inadvisability of giving large orders for machines which were obsolete, and large orders for engines simply because of Government design. That particular R.A.F. engine was, as compared with any other engine, less efficient, less reliable than any other standard aeroplane engine in the world. There were engines of about six or seven pounds per horse-power for six hours' flying, and here was an engine of eleven pounds per horse-power, and yet, because it was a Government design, orders approximating to 2,500 of this type were being and had been given. He knew Lord Curzon was earnest and anxious to get on with his gigantic task and regain for us the supremacy of the air, but that supremacy could be regained, certainly to a large extent, by human endeavour such as the bravery and skill of our flying men. He hoped Lord Curzon, no matter what advice he might have from officials either one way or the other, would exhaust every possible advice of the trade and the services of the interested and disinterested people, and then come to a decision, but not to be led astray by interested officials in various Government Departments who were anxious to see the child of their own imagination at all costs used more freely in the service than other, and possibly more capable, productions of private enterprise.

Major Baird (representing the Air Board): The hon. gentleman dealt in a very kindly manner with the Air Board, and he thanked him for the expression of his intention to assist them to the best of his ability. They were always anxious to hear any suggestions from people of experience which would help them to carry out the terms of their reference, and the matter of engines and types of machines was specifically included in the reference which had already been read to the House. He could assure the hon. member that that was not a question which was being lost sight of, but on the other hand, he surely must know that you could not order types of machines without great examination and great inspection, and, from the very nature of the case, a machine may become obsolete, or obsolescent, before the order was completed, and the main difficulty of the whole problem was to keep not only abreast of what the Germans were doing, but to go one better as far as we possibly could. The hon. member would believe him when he told him that that was a question which the Board realised to the full as clearly as anyone possibly could, and the experienced aeronautical officers who serve on the Board as the technical advisers of the President were fully competent to give advice, from their experience and practical knowledge, on those matters. He could not help thinking that the hon. member, if he had thought over the matter more, would not have brought up the case of that most regrettable accident which occurred a few days ago. He could not believe it could be to the advantage of the service, or that it was in accordance with the traditions of that House, that an accident of that painful nature, which was now forming, as all accidents always do form, the subject of official investigation, should be brought up and dealt with in that House while that investigation is going on. The mention of such a subject at such a time could only be a source of pain and suffering to those who had already suffered enough.

Mr. Billing suggested that if the Government had taken the opportunity of correcting the Press reports he would never have

dreamt of referring to it, but he thought, in justice to the memory of the man who was killed, somebody should call attention to it, so that a correction might be made in the Press.

Major Baird said he could assure the hon. gentleman that if a correction was found necessary that correction would be made, and the last thing that was conceivable was that injustice should be done to anyone. The machine was a dual control machine, and the

officer to whom he referred, and who was unfortunately killed, was not the pilot.

He could assure Mr. Billing that Lord Curzon was fully alive to the importance of careful inquiry into the types of machines before ordering, and he was ready to welcome any suggestion which the hon. Member, or any other competent adviser, was prepared to place before him.

QUESTIONS IN PARLIAMENT.

R.F.C. Transfers to R.N.A.S.

MR. BLISS asked in the House of Commons, on June 1st, whether an officer relinquishing his commission in the Army, with the consent of the War Office, in order to join the Royal Naval Flying Corps in response to the call for qualified men, is entitled to receive the gratuity provided in Article 497 in the Army Regulations for the period they have served in the Army?

MR. FORSTER: Yes, sir; if the officer would be entitled to the gratuity under ordinary circumstances, and the transfer is made in the interests of the public service.

Aircraft Messages and "Summer Time."

MR. PETO asked whether, under Order dated May 21st, officers are instructed, when sending aircraft messages to a certain naval centre, to use Greenwich mean time, indicating this by the letters "G.M.T." after the figures, and to change all messages received from military sources which have to be transmitted to this naval centre into Greenwich mean time; and whether, in view of the complexity of this arrangement, he cannot arrange for the Naval Service, as well as the Military, to comply with the Summer Time Act?

DR. MACNAMARA replied that the answer to the first part of the question is in the affirmative. With regard to second part of the question, it is not expedient, for naval purposes, to make this change.

Canadian Officers in the R.F.C.

MR. JOYNSON-HICKS asked the Financial Secretary to the War Office if he is aware that officers of the Canadian Expeditionary Force, who have been transferred to the Royal Flying Corps, receive no additional pay either while under instruction or after having qualified; and if he can see his way to remedy without delay this inequality of treatment to these young officers?

MR. FORSTER: Canadian officers serving with the Royal Flying Corps remain in the pay of the Canadian Government, and receive the rates of pay authorised by that Government.

THE R.F.C. INQUIRY.

AT the resumed sitting of the Committee of Inquiry into the Command, Administration, &c., of the Royal Flying Corps, on June 1st, Mr. Justice Bailhache again presided.

The first witness was Sir Alfred Mond, who, explaining various points in the speech he made in the House of Commons on March 28th, said that he thought the air service had not been considered sufficiently as an independent arm. He expressed regret that the airship section of the Royal Flying Corps was abandoned, and the whole section handed over to the Admiralty. He had no knowledge why this step was taken, but it appeared to him that the airship as a factor in long-distance bombardment on land was in many respects more suitable than aeroplanes, and also, of course, for purposes of defence against other aircraft.

Members of Parliament had difficulty in getting what might be called legal evidence. They received information from apparently reliable people, but such evidence was not always of a satisfactory or reliable character. Personally, he had not made any allegations against the eminent men who were conducting difficult departments in difficult circumstances. On February 15th last Mr. Bonar Law spoke of the great scarcity of material and the need of engines. He (Sir A. Mond) asked—How long ago was it that this engine shortage occurred, and what steps were taken to communicate with manufacturers who could supply these engines? No doubt there was a difficulty in obtaining labour, but great as the difficulty might be, it was not an impossibility. He was told that one firm—the name was given privately to the Chairman—of motor-car makers who could build engines rapidly were engaged in making Staff cars for the War Office. The greater part of this firm's factory was, about two months ago, turned over for building engines, though the other portion was still employed in building cars. Another important works, he was informed, whose plant was evidently suitable for the manufacture of aeroplane engines, was employed in making shells of a small type for the Ministry of Munitions. Another company offered to build engines for the R.F.C., but for some reason the offer was not accepted. Instead the R.N.A.S. accepted

the offer, and were extremely pleased with the result. There had been a tendency, he continued, to discourage outside experiments.

MR. BUTCHER: Does that complaint come chiefly from manufacturers?

SIR A. MOND said it came from outside aeronautical circles. With regard to inventions, in one case a young engineer has designed a novel type of quick-climbing machine, which was favourably received by the authorities and the War Office, and they asked him why he did not have it built. This man explained that he had no money, and he was then told he ought to get someone to finance him.

The Chairman observed that it was not fair for people who had grievances against Government Departments to go about publishing their grievance without giving the Committee an opportunity of investigating them. It was not quite fair for them to decline to give their names.

Witness quoted Mr. Tennant's statement in the House of Commons that sometimes we were superior in the air, and sometimes the Germans were.

GENERAL SIR H. SMITH-DORRIEN: Do I understand you to say that we have not got superiority in the air at the present moment?—I did not say that. That was Mr. Tennant's answer.

Don't you think the report that comes in from the long line we are holding must vary, and that at some parts we have the superiority and that at others we have not?—It is extremely likely.

Therefore it is very difficult really to say one way or the other that we have superiority?—I should think that equality was a better description of it. I should think from what I have heard that we had a greater superiority when the war began than we have to-day.

MR. BUTCHER suggested that our airmen flew fifty miles over the German lines to every mile the Germans flew over ours.

SIR ALFRED MOND replied that when on a visit to the front in February the German airmen were flying cheerfully ten miles behind our line, and that the place he was at was bombed.

SIR H. SMITH-DORRIEN said that a brigadier-general just home

from the front said to him that he was "very much satisfied with the Flying Corps."

Sir A. Mond said his next point had reference to the Fokker machine, which, he understood, was offered to the British Government. The Under-Secretary said it was not the Fokker, but another machine invented by Mr. Fokker. His criticism was that it seemed a pity they could not keep in touch with the inventor of the Fokker or any other new type, and secure it for ourselves rather than let the Germans have it.

General Sir David Henderson intimated that he would call evidence at the proper time in regard to motor works not being employed in building engines, and asked Sir A. Mond whether he could state of his own knowledge, or could find any one who could state before the Committee, that outside designs of engines had been submitted to the Royal Aircraft Factory.

Sir A. Mond: I dare say I could. I have heard of such a case.

General Henderson: You say we have no power to spend money on inventions. Have you any knowledge yourself of the inventions we are trying?—No; but are you satisfied you can spend the money you want without being interfered with?

General Henderson: I have not been stopped yet.

General Henderson: Do you really think the Fokker is better than our machine or the French one from which the Fokker was copied?—I could not say. If it was not, why should it have surprised our airmen so much?

General Henderson: It was dealt with as soon as it appeared and we found what was going on.

General Henderson claimed that we had held military superiority over the Germans during the whole of the war, whatever improvements they had made in their machines. Alluding to witness's suggestion that the Government should have kept in touch with Mr. Fokker, Sir David asked, "If a gentleman becomes a naturalised German subject, it is perhaps a little difficult to keep in touch with him?"

"Naturally," was the reply.

Mr. A. Lynch, M.P., was next called, and he said he wished to clear up two or three points in regard to the evidence he gave a

fortnight ago. He supplied the addresses of two of his informants. Another one was unwilling to give his name. He handed to the Chairman a document containing a few suggestions which the committee might like to have. Mr. Lynch went on to say that he had a letter from an inventor who had submitted a new principle—or at any rate quite original details—to the War Office, and they told him that to obtain a hearing he must be in a position to say that he had constructed an aeroplane of that type and had actually flown it. That, said Mr. Lynch, was not the proper way to deal with constructors. He admitted, however, that he had recently come to the conclusion that inventors might be divided into three classes—(1) inspired men, or (2) inspired idiots, or (3) where the word "inspired" would not be in order. After his experience he had now more sympathy with the War Office in the matter of dealing with inventors than he had previously. At the same time, though an invention might show an amount of ignorance of the principles of science, there was nearly always to be found the germ of some good idea.

The Chairman: You ought to have something more than the germ of an idea before you spend public money.

Mr. Francis Knight, a retired clergyman living at Putney, obtained permission of the Chairman to read a document to the Committee. He said he felt it his duty to emphasise the necessity of increased means of aerial defence. Officers of the R.F.C. should be called to give evidence. The inquiry would be a farce unless private firms were called to give evidence *in camera*. He complained that the Government had not availed themselves of a perpendicular gun which he had invented.

The Chairman: We are obliged to you for coming here, but we need not trouble you farther.

Mr. Knight (addressing the Chairman): May I ask what nationality you belong to?

The Chairman: No, you may not; it is rather impertinent.

Mr. Justice Bailhache announced that there were two more witnesses, Mr. Grey and Mr. Pemberton Billing, but as they wanted time in which to prepare their evidence, the Committee would adjourn till June 23rd.

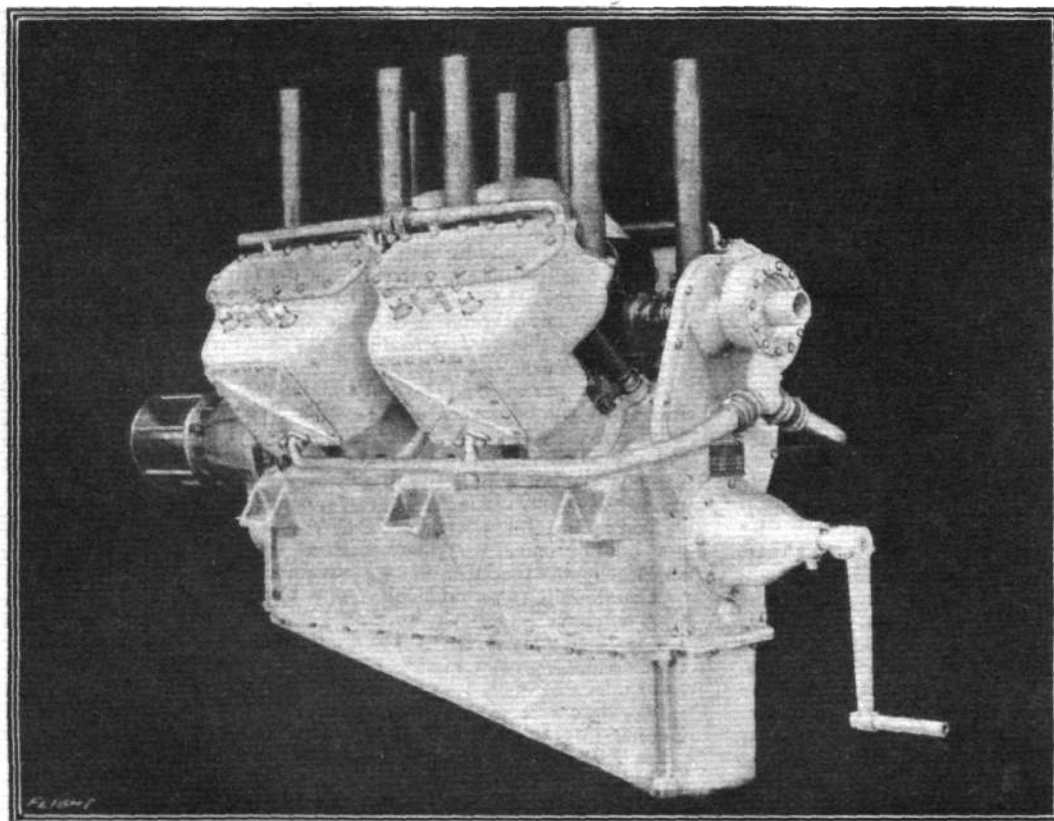
The Society of British Aircraft Constructors, Ltd.

IN "FLIGHT" for April 20th last a list was given of the members of the Society of British Aircraft Constructors, Ltd. Since then the following have been elected:—

Ordinary Members—W. H. Allen, Son and Co., Ltd.; Sir W. G. Armstrong, Whitworth and Co., Ltd.; Arrol-Johnston, Ltd.;

Brazil, Straker and Co., Ltd.; Gwynnes, Ltd.; Portholme Aerodrome, Ltd.

Associate Members—Accles and Pollock, Ltd.; The Allied Aircraft Varnish Co., Ltd.; W. N. Brunton and Son; Cellon Limited; Samuel Cutler and Sons, Ltd.; The Integral Propeller Co., Ltd.; Lang Propeller, Ltd.; Arthur Lee and Sons, Ltd.; Rubery Owen and Co.; C. C. Wakefield and Co.; Waring and Gillow, Ltd.



The 8-cyl. 135 h.p. Thomas motor.—We understand that, as a result of minor improvements, the petrol consumption has been reduced from 14 to 13 gallons per hour or 58 lbs. per b.h.p. per hour. The consumption of lubricating oil is given as 1 gallon per hour.



ARMCHAIR REFLECTIONS



By THE

"DREAMER."

ON this day, like everybody in these Islands, I can reflect upon one subject, and one subject only—our Magnificent Navy. It would surely be excusable were I to devote every line of this my page this week in writing my appreciation of their bravery and sacrifice—those who have laid down their lives for England in the great sea battle.

The glorious history of our Navy is inseparably intermixed with sadness. It was ever so, and must remain whilst ships of war carry death and destruction to ships of war.

Glorious and sad is the news of that great Naval battle which, all unsuspected by us here in comfort at home, was for our sakes raging out there on the great North Sea last Wednesday, raging almost at the very door of our enemy!

Our Navy has earned and carried a glorious record from time immemorial, and splendidly did those of our ships engaged in the great battle of last week uphold the traditions of England's mighty sea-power.

We have lost many ships. This was only to be expected, and we can bear the loss with equanimity. No two great sea-powers could possibly fight under modern conditions without the loss on each side being enormous. High explosives and scientific gunnery, backed up by under-water craft, is bound to create havoc on both sides.

Victory can only rest with those who see the fight through to the end, prevent the enemy from carrying out their objective, and remain masters of the battle ground when the others have either fled, surrendered, or gone to the bottom. And this we may safely claim to have done, although the cost in men and material is terrific—a corollary impossible to be otherwise.

Unfortunately our death-roll is high, so high that one hardly dare think about it. Many brave men have given up their lives in order that this fresh page of glorious history shall be added to the annals of Great Britain. The first reports are staggering in their vastness, future reports can hardly, unfortunately, do other than increase the list of casualties.

We may glean some inkling of what a modern naval battle is like, to what pitch science and training has brought the capabilities of man to deal out death and annihilation to his fellow man, when we read that ship after ship on both sides, huge leviathans of the sea, vessels carrying upwards of a thousand humans on board, were rent and split asunder like boats of paper, sinking in a few moments, and carrying with them to an ocean grave every soul on board.

And what can we say for those who are gone—what is there to say beyond "Well done"? Magnificent as it is, they have only done what we expected them to do, what they were bound to do, what we knew they would do, coming as they do, many of them, from stock which for generations have manned our gallant Navy.

Boys there were in those great ships, boys in their teens, sons of Admirals and Captains, Admirals and Captains whose forefathers away back into the remote past were Admirals and Captains with Nelson, and

before him, each in emulation of his forebears adding his duty to the mighty whole which has made, and will keep, Britannia Mistress of the Seas so long as sons are born to seamen.

This nipping in the bud of these young lives, the lives of boys who were but a few short years ago children of the nursery, appears to me to be a great blow to our future generations of naval fighting men, thereby seriously jeopardising the source for the supply of these men, upon whom will fall, in the coming years, the task of taking the ships of their King to the four corners of the world in honour of their country.

For it is in these boys that succession is vested. Great as is our sorrow at the losing of valuable men who command our battleships, that sorrow becomes doubly great when, not only are these brave and skilful men taken from us, but their progeny, those to whom we have to look for the furthering of the gallant race, are taken also, and this without what to a landsman seems adequate reason.

I suppose, were I to suggest such a thing as that these noble young spirits should not accompany their ship when she is out on such death-dealing business as that of last week, I should bring trouble about my ears, not the least insistent of which would be these little "Middies" themselves, for the salt of the sea and the fighting blood of generations is in their veins.

Opposed to the above suggestion, we have the report of one who in the destroyer "Onslaught" took part in this latest melee. One of these midshipmen it appears was, after the destroyer had sunk a German battleship, on the bridge with his commander and other officers when a shell from the enemy spread death around, clearing the bridge of all but himself. Yet, so the story goes, this boy, with the courage, coolness and resourcefulness of a grown man, took his vessel out of action, piloted her through those mine-strewn waters, and, although all charts were destroyed by the explosion which robbed the ship of her officers, brought her and the rest of the crew safely into port. In the face of such happenings, what can a mere "landlubber" suggest?

I suppose there is no other way of turning midshipmen into admirals except through the hard school of experience, and, therefore, these things must be, although modern naval battles are vastly different affairs to those of bygone days. In the great Battle of Trafalgar, for instance, Britain's losses in men was less than half the crew of a modern battle cruiser, and the little "middie" stood a fair chance of coming out unscathed, and with a deal of valuable experience.

England has been immune from anything approaching the tremendous sea-fight of last week, for so many years, and so much data will no doubt have been gathered from that event, that perhaps many new conditions may be instituted in the Service, and it may be that it will be thought inexpedient to take such valuable young lives into action. Even so, I can quite see the possibility of these same "Middies" being the first to kick against any such new regulation. That's the worst of that "Bull-dog" spirit the young rascals are born with.

BRITISH AIR WORK.

THE Air Board has decided to publish at intervals a *résumé* of the principal incidents described in the reports received from the Royal Naval Air Service and the Royal Flying Corps in the various theatres of war. The incidents selected are such as appear to be of general interest to the public.

It must be borne in mind that a great deal of extremely valuable and dangerous work is being carried on which does not lend itself to publication. The following is the first of these communications, published on June 2nd:—

Royal Naval Air Service (Flanders).

May 4th.—Nineteen machines carried out a raid on Mariakerke Aerodrome, and 50 65-lb. bombs were dropped. Heavy anti-aircraft fire with incendiary shells was encountered; two of our machines were lost. The rest returned in safety.

May 20th.—Flight Sub-Lieut. A., in a Nieuport scout, when four miles off Blankenburghe, observed a German seaplane. Diving down to 4,500 ft., the pilot succeeded in getting above and behind the enemy, and fired 25 rounds at close range. The enemy machine was observed to swerve and dive into the water. It sank, reappeared, and finally sank.

May 21st.—(a) During the early hours an Allied raid was carried out on the enemy's aerodromes and places of military importance. Sixteen R.N.A.S. machines dropped 38 65-lb. bombs and 17 16-lb. bombs on Mariakerke Aerodrome. One seaplane dropped one 100 lb. and two 65-lb. bombs on the Solvay Works, Zeebrugge. All these machines returned safely with one exception.

(b) An attack was made upon Dunkirk by hostile aircraft. Several British machines went up with the object of cutting off the enemy on their return journey, in the vicinity of Nieuport. Flight Sub-Lieutenant D., in a Nieuport scout, attacked three machines at a range of 400 yards. He opened fire on one machine, and observing another about 900 ft. above him making seawards, gave chase and fired the rest of the tray. He then reloaded and climbing to 10,000 ft., encountered a large two-seater, which opened fire at long range. Flight Sub-Lieutenant D. opened fire and observed tracer bullets entering the machine, which started to smoke violently and nose-dived towards the sea. Another officer who was in the air at the same time states that he observed in the same locality what appeared to be a machine on fire, enveloped in a volume of black smoke. A fourth hostile machine was encountered, and fired upon until Sub-Lieutenant D.'s ammunition had been expended.

(c) Flight Sub-Lieutenant E., in a Nieuport scout, when six miles out to sea, over Zuydcoote, observed five hostile machines together and another one a little way behind. Climbing rapidly the pilot attacked the last one at close range of 100 yards. The hostile machine suddenly dived steeply, but the pilot was unable to ascertain the result as he was attacked from behind by three scouts, probably Fokker biplanes, at a range of 100 ft. Flight Sub-Lieutenant A. turned round to meet them, and reloading continued to fire. These machines, however, made good their retreat over the lines.

(d) Flight Commander A., in a Nieuport scout, followed the raiders out to sea, opening fire when off Mariakerke. He closed with three machines, one of which was seen to topple over suddenly and nose-dive out of sight. Reloading, the pilot attacked another machine, which, after a few rounds, was observed to dive steeply. The third machine did not attempt to engage, but flew back over the lines. It is probable that one, and possibly two, of these machines were destroyed.

May 22nd.—Flight Sub-Lieut. G., in a Nieuport scout, observed five hostile machines in close formation and one further in the rear, which he attacked at very close range and from underneath, the tracer bullets entering the *fuselage*. The observer of the enemy machine fired a few rounds and then broke off, as though killed or wounded, our machine still being an easy target. The other hostile machines drew away.

Royal Flying Corps (France).

May 4th.—Lieut. D., pilot, and Second Lieut. D., observer, attacked two hostile aeroplanes, a Roland and an Aviatik, over Fromelles. The hostile machines came from the north-east at 8,500 ft. and 8,000 ft. respectively. Lieut. D. steered straight towards them. The Roland opened fire at 150 yards, and Second Lieut. D. at 70 yards. The Roland turned, the observer standing up to fire. Lieut. D. followed, and the Aviatik came up behind him and opened fire. Both pilot and observer of our machine were now firing, being between the two hostile machines. They got within a few yards of the Roland, which ceased fire and dived steeply, but apparently under control, towards Wavrin. The observer was apparently hit, as he disappeared from view and firing ceased. Lieut. D. then turned towards the Aviatik, which, how-

ever, went down in the direction of Wavrin. Lieut. D.'s machine was badly damaged, but pilot and observer were unhurt.

Second Lieutenant C., on a de Havilland, sighted a hostile machine flying south at about 1,500 ft. between Hem and Clery. He dived down and overtook the German, who also dived close to the ground, firing about 12 rounds at a range of 50 yds. The German machine tried to land, but hit a wire fence and broke up. Second Lieutenant C. climbed to 200 ft., when he again dived, firing the rest of his drum at the pilot and observer, who were running across the field. One of them fell, and the other took refuge in a shed. Meanwhile Second Lieutenant C.'s thumb switch had jammed and he was forced to land, but the bump on landing loosened the spring, and he got off again, crossing the lines at about 500 ft. under heavy fire. Captain T. was killed by anti-aircraft fire. His observer, Second Lieutenant H., climbed back into the pilot's seat and found the rudder jammed. He, however, managed to land the machine in our lines and escaped unhurt.

May 16th.—*Combats*.—Twenty-seven combats in the air took place. Lieutenant D. and Corporal S. on an F.E. attacked an Albatros when approaching Lille. Half a drum of ammunition was fired, and the hostile machine spiralled rapidly down, firing occasionally. Later, the same machine was observed climbing again over Lille, and following the F.E. at about 500 yards. Lieutenant D. wheeled sharply and opened fire at close range. The Albatros sheered away to the right, followed by the F.E. still firing at close range. The hostile machine then went down rapidly, and was seen to strike the ground at a cross roads south of Lille. Smoke rose from the spot and only one wing was visible. The F.E. was then attacked by a Fokker monoplane, which was driven off.

Second Lieutenant B., on a Bristol scout, when flying at 12,000 ft., saw an Albatros at 5,000 ft. over Givenchy. The hostile machine turned towards Beaumont, followed by Lieutenant B., who opened fire when about 2,000 ft. above, and continued until within a few yards. The hostile machine turned and got into a nose-dive, and when about 2,000 ft. from the ground was seen to turn upside down.

May 19th.—*Combats*.—Lieutenant P., on an F.E., observer Air Mechanic H., on patrol north-east of Ypres, sighted three hostile machines. He engaged one of them, which turned and met him face to face, being slightly below him. Fire was opened, and the enemy machine side-slipped, and then dived vertically. The F.E. saw no more of the hostile machine.

Sergeant N., on a de Havilland, sighted a hostile machine over Bixchoete flying north. He flew towards Langemarck, and cut off the hostile machine from its own lines. It was then below him, and did not observe him. He dived, and fired a drum, but while reloading lost sight of the machine. One hostile machine was seen to fall in the enemy's lines. This was probably the first of the above machines.

Lieut. R., on an F.E., observer Lieut. M., encountered a Fokker. Fire was opened at 50 yards, and the enemy machine side-slipped, turned on its back, and crashed to earth. Its fall was observed by a B.E.

May 20th.—An Aviatik was engaged by three of our machines over Adinfer Wood—viz., two F.E.'s, pilots Captain A. and 1/A.M.C., observers Second Lieut. C. and Corp. H., and a B.E. 2c., pilot Lieut. F., observer Second Lieut. C. The B.E. attacked first. Air Mechanic C. then dived from 9,000 ft., and attacked the Aviatik at 5,000 ft. Finally, Captain A. closed to within 20 yards, and fired two drums at the Aviatik, which went down in a nose-dive, and crashed into the trees.

An Albatros was attacked by three of our machines over Poziere, a Martinsyde, pilot Captain S., and two de Havillands, pilots Lieut. W. and Second Lieut. T. Lieut. W. attacked first, opening fire at 50 yards, and turned aside owing to his gun jamming. Captain S. on the Martinsyde then attacked at 30 yards range, apparently without effect. Second Lieutenant T. then dived on to the hostile machine from above and fired a drum at 40 yards from behind it. The hostile machine burst into flames, and fell between Poziere and Contalmaison.

May 21st.—Second Lieutenant T., on a Martinsyde, flying at 12,500 ft., saw an Albatros over Fromelles at about 9,000 ft. He dived at it, reserving his fire till within close range. Both machines were diving at high speed with engines on. Second Lieutenant T., having expended one drum, changed, and continued the attack. The enemy endeavoured to manoeuvre out of fire, turning in all directions, but Second Lieutenant T. manoeuvred his Martinsyde, and managed to keep the enemy under fire at intervals. At about 4,000 ft. over the south-west corner of Lille the machines were so close that they nearly collided; but the enemy after descending in a vertical dive recovered himself and escaped.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

War Office, May 29th.
"Egypt.—On the morning following the battle our aeroplanes threw bombs on a large body of men fleeing from El Fasher (the capital) with Ali Dinar (the Sultan). The latter, when last seen, had a following of only 300 persons, and was faced by a journey of one and a half days across waterless desert before he could reach Gebel Marra (90 miles distant)."

General Headquarters, May 30th.
 "Yesterday enemy aircraft were more active than usual. One of our machines was shot down as the result of combat in the air, falling in our own lines. A hostile machine was forced down out of control within its own lines."

General Headquarters, June 1st.
 "Yesterday our aeroplanes, while on reconnaissance, had a long running fight with three hostile machines. One enemy machine was driven down, and one of our machines is missing. During the night hostile aircraft dropped eight bombs on Poperinghe, doing no damage."

War Office, June 1st.
"Egypt.—In Egypt reports that the Australian and New Zealand mounted troops carried out another successful enterprise on the morning of May 31st, delivering an attack on an enemy post at Bir Salmana (about twenty miles E.N.E. of Matia). The enemy were compelled to abandon their camp, and were driven eastwards with considerable loss. At eight a.m. our aeroplanes took over the pursuit from the mounted troops and bombed the flying enemy, inflicting further casualties."

General Headquarters, June 2nd.
 "The clear weather enabled much successful aerial work to be done yesterday. There was a certain amount of fighting in the air, as a result of which one of the enemy's machines was brought down and subsequently set on fire by our artillery, whilst another was driven to the ground damaged just behind the enemy's lines. One of our balloons was carried away by a sudden gust of wind and driven over the enemy's lines. Both the occupants reached the ground safely inside our lines by means of parachutes."

General Headquarters, June 4th.
 "Yesterday a squadron of twenty-six of our aeroplanes bombed some points of military importance. Considerable damage is believed to have been done. One of our machines was brought down in the enemy's lines by gunfire. The remainder returned safely. Hostile aircraft were inactive."

French.

Paris, June 1st. Afternoon.
 "Last night one of our air squadrons dropped about twenty bombs on the stations of Thionville and Audin-le-Roman and fifty bombs on the supply centre at Azannes."

Paris, June 1st. Evening.
 "A group of German aeroplanes this afternoon dropped several bombs on the open town of Bar le Duc. Eighteen civilians were killed, including two women and four children, and twenty-five were injured, including six women and eleven children. An Aviatik attacked by one of our machines, was forced to land in our lines to the south of Bernécourt (region of Toul). Both aviators were made prisoners."

Paris, June 2nd. Afternoon.
 "Yesterday our squadrons gave battle to a number of aeroplanes which had bombarded Bar-le-Duc, and scattered a second squadron. A German aeroplane was brought down near Etain. In the course of the pursuit a Fokker attacked by two of our machines was brought down near Bouconville."

Paris, June 4th. Evening.
 "About noon to-day a group of German aeroplanes dropped several bombs on Toul. Six persons were killed and ten injured. The material damage was unimportant. No military establishment was hit."

"The Toul chasing squadron, having taken the air immediately, vigorously pursued the enemy machines. One of the latter was brought down in our lines at Sanzey, about seven miles north of Toul. Two other enemy aeroplanes, as the result of the machine-gun fire from our aeroplanes, descended suddenly in the German lines."

Russian.

Petrograd, May 30th.
 "Enemy aviators dropped some bombs on the railway station of Vileyka and the small town of Voyston, north-west of it."

Petrograd, May 31st.
 "On the whole front aerial reconnaissances were carried out by the enemy with great persistence. One of our aeroplanes engaged an enemy Albatros which was flying over the enemy's lines. Our

machine bombarded the Albatros with machine-gun fire, and the enemy machine fell enveloped in smoke north-west of the town of Baranovitchi."

Petrograd, June 1st.
 "Two of our aerial squadrons carried out raids on positions at the rear of the enemy's lines. One of these squadrons, comprising six machines, bombarded the region near the town of Soly, north-west of Smorgon, while another, composed of 14 machines, threw bombs on the railway station at Manevitch on the Sarny-Kovel railway. In the first case 48 bombs were dropped, and in the other 66, causing outbreaks of fire. Notwithstanding a very hot fire from the enemy's artillery to which they were exposed, all the aviators returned uninjured to their base with their machines."

"In the Black Sea one of our submarines, in the course of a reconnoitring expedition, sank five sailing ships and towed one to Sebastopol. The submarine was attacked without success by an enemy seaplane."

Petrograd, June 2nd.
 "An enemy aeroplane dropped six bombs on the station of Budslave, north-east of Vileyka."

Italian.

Rome, June 3rd.
 "Enemy aircraft dropped bombs on Ala, Verona, Vicenza, and Schio. The damage was very slight, and six persons were injured in Verona. Our squadrons of Caproni and Farman machines dropped some hundred bombs on the enemy parks and encampments at the bottom of the Astico valley with clearly excellent results, and returned in safety."

German.

Berlin, May 30th.
 "Yesterday evening our airmen attacked an enemy destroyer squadron off Ostend with visible success."

"A British biplane fell to earth after an air fight, and was destroyed by our artillery."

Berlin, June 1st.
 "West of Cambrai a British biplane was shot down in an air fight. The occupants—officers—were wounded and captured."

"The French afternoon communiqué of May 29th asserts that on May 28th five German aeroplanes were destroyed by French airmen and anti-aircraft guns. For a long time past we have not concerned ourselves with correcting the enemy's despatches, but in this case, which affects the air service, a young arm, we declare that neither on the day mentioned nor for a week previously was any German aeroplane lost owing to hostile action."

Berlin, June 2nd.
 "South-west of Lille an undamaged British aeroplane, with its occupants, fell into our hands. In an air fight a French monoplane was brought down over the Marre Ridge and within our lines, one biplane over Vaux, and another west of Moerchingen. A British biplane brought down yesterday is the fourth machine put hors de combat by Lieutenant Mulzer."

"To the south-east of Lake Drisviaty a Russian aeroplane was destroyed by our anti-aircraft guns."

Berlin, June 3rd.
 "Our field artillery shot down a Farman biplane over Vaux. The biplane mentioned in yesterday's report as having been shot down west of Moerchingen is the fourth which has been brought down by Lieutenant Hoehndorf."

Berlin, June 5th.
 "In each of three aerial fights over the Marre Ridge, over Cumières, and over Fort Souville a French aeroplane was brought down."

"During May the enemy losses were: In aerial fights 36, by hits from the ground 9 machines, and by forced landing behind our line 2 machines, making 47 machines."

"Our losses were: In aerial fights 11, machines not returned 5; 16 machines."

Austrian.

Vienna, June 1st.
 "Early to-day several of our seaplanes dropped numerous bombs on railway stations and military works at San Giorgio di Nogaro. Four hits were observed at the station."

Vienna, June 5th.
 "South-east of Lutsk we shot down an enemy airman."

Turkish.

Constantinople, May 30th.
 "In the Smyrna sector our guns drove off three enemy aeroplanes which appeared over Phokia."

Constantinople, June 1st.
 "On Monday hostile aeroplanes dropped thirty bombs on some quarters of Smyrna, killing and wounding several persons and damaging some houses."

"On Saturday a hostile torpedo-boat and hostile aeroplanes

attacked El Arish (90 miles east of Port Said). Some bombs were dropped, wounding seven persons. Two of our aeroplanes effectively

bombed a warship and enemy aeroplanes off El Arish and made good use of their machine-guns."

From Other Sources.

A REUTER message from Cairo on May 21st says:—

"It is officially announced that, no doubt in retaliation for the successful British attack on El Arish on May 18th, two enemy aeroplanes dropped sixteen bombs on Port Said this morning. The bombs were mostly directed against the Arab quarter. Two civilians were killed, two severely and 11 slightly injured. Five soldiers were wounded, one seriously. An eye-witness affirms that the air-men used searchlights in each case before dropping their bombs. Anti-aircraft guns quickly drove off the machines."

It was announced in Petrograd on May 23rd that Russian airmen had dropped large numbers of bombs on the railway station of Ponevezh (on the Dvinsk-Libau line) and destroyed the permanent way of the railway from Libau for a distance of several kilometres. They also demolished some ammunition depôts.

Information was received in Amsterdam that on May 23rd a train carrying four destroyed German aeroplanes passed through Gemmenich, the machines having been hit by enemy artillery near Courtrai.

Mr. W. Beach Thomas, writing to the *Daily Mail* from British headquarters in France on May 21st, said:—

"Great adventures in the air become, in these latter days of bright skies and light winds, the commonplaces of official chroniclers, both with the enemy and ourselves. It is eloquent of the activity of this warfare that the Germans lost an average of three machines a day throughout March and April—I speak of the whole of their front—and they have fought many stirring battles."

"Airmen, of course, do not go out to fight. Their chief business is to see and photograph or to prevent others from seeing and photographing. The Germans above others use the great speed they have attained chiefly in escaping attack, as a good airman should do. But you cannot fulfil your mission without fights; and the best defence is often offence. Not once or twice lately rival airmen have made straight for one another head to head, like two bulls charging. They have never yet met, because the heart of one or the other always gives out too soon, but the fighting is often at a distance not double the length of a cricket pitch. Of the machines that have met their fate a very large proportion are shot down from the air. The 'Archie,' or anti-aircraft gun, scares and hits many more than it brings down. The other day, for example, a shell went clean through the armoury of one of our single-seaters. It missed the pilot's shins by inches, and though it did not explode made a mess of the machine on both sides. The airman felt that something rather unusual had happened, and was aware of dust and debris and a rocking machine. But the confusion made little or no difference to him. He quickly recovered balance, went on flying, and ultimately returned to his aerodrome with ease and safety. Another of our pilots shot down an enemy in the air. But the fall was not, as it is called, a "cra-her," only a nose-dive, which may mean anything, so he followed the diving enemy in order to see the finish and complete the victory. Unhappily, as he neared the ground his 'joy-stick,' or lever handle, jammed in some way, and though he was well within the enemy's territory, he was forced to come to earth."

"Then, like the mythical giant, the touch of earth renewed his force. The jar released the 'joy-stick,' and he skimmed into space again as a swallow lifts after touching water. Nor was he touched by hostile fire. The prevalence of the east wind has proved, of course, a welcome advantage to our men. The wounded German cannot now slide home to safety as he has done a score of times on the oarage of the west wind. It is easier, too, to gauge the length



Rewards for the R.N.A.S.

In a list of naval honours given in a supplement to the *London Gazette* issued on May 31st there appeared the following:—

The King has been graciously pleased to approve of the award of the Distinguished Service Cross to the undermentioned officers:—

Flight Sub-Lieutenant HENRY KARSLAKE THOROLD, R.N.A.S.

Sub-Lieutenant REGINALD HENRY PORTAL, R.N.

For conspicuous gallantry during a combat with an enemy aeroplane in the Dardanelles. At the outset Flight Sub-Lieut. Thorold, the pilot, was severely wounded in the back, and Sub-Lieut. Portal, the observer, in the thigh and arm. The pilot momentarily lost control, and the machine nosed dived, but he soon regained control, and the observer succeeded in firing another two magazines, whereupon the enemy aeroplane sheered off and disappeared. The pilot took his machine safely back to the aerodrome, a distance of about twenty-five miles, and, after making a perfect landing, lost consciousness.

of a reconnaissance flight. It will give some idea how the air hums with aircraft when I say that within one day during this fair May weather five-sixths of our available pilots were 'up' on business.

"And what is the moral of these flights? Who holds the lordship of the air? We and the French have the better and the more adventurous pilots. We have new planes of very rapid climbing power, with new and more powerful engines. Fokkers have on occasion been outpaced. The Germans on their side have, as all electricians know, the best magneto, and their engines are singularly compact and perfect, and of very high power. As in many departments, they owe their points of superiority in war, as in peace, to the thoroughness of their technical training. Their failure is in individual quickness—in the air as in the trench. I may quote in illustration of the point an Anzac soldier. He was discussing Boche snipers. 'They are good,' he said, 'and very accurate, but terribly slow.' It is a pity that we cannot say the same of their engines."

Mr. G. Renwick, writing to the *Daily Chronicle* from Salonica on May 24th, says:—

"French aeroplanes carried out an extensive raid on enemy territory to-day. Leaving Salonica early in the morning one squadron bombarded hostile encampments at Xanthi (in Bulgaria, on the Salonica-Constantinople railway, near the Greek N.E. frontier), causing considerable damage. A second squadron first bombarded Veles (Kopruli, Serbia, on the Middle Vardar), and then, flying farther north, dropped a number of shells on Uskub. This is the first time Uskub has been bombed by aeroplanes. At both places material damage is reported to have been done. All the machines returned to Salonica safely."

It was reported in Rome on May 28th that a naval dirigible the previous evening dropped 28 bombs on the enemy's battery at Punta Salvore (at the entrance to the Gulf of Trieste) with excellent results, and returned safely in spite of the heavy fire to which it was subjected by the enemy artillery.

A message to the *Petit Parisien* from Salonica on May 26th stated that during the morning German aeroplanes flew over the lines and dropped bombs. The French aviators again bombed the enemy camps north of Petritch.

The military critic of the *Berliner Tageblatt*, in an article explaining the difficulties with which the Germans have to contend before Verdun, makes the significant admission that the transport of new artillery and munitions to that front is greatly interfered with by the fact that all the railways and roads used for this purpose are being constantly watched and bombarded by French aviators.

According to the *Echo Belge*, the Germans have established an aerodrome on the plateau of Ans, near Liège.

Mr. W. Beach Thomas, writing to the *Daily Mail* from the British headquarters in France on May 30th, says:—

"One individual air feat deserves recording. One of our aerial photographers took in one flight a continuous stretch of eight miles of trench; and every inch of the series of photographs is clear and precisely defined."

A message from Rome states that an enemy seaplane was brought down in the Lower Adriatic on May 30th.

The *Times* correspondent at Salonica, writing on June 1st, says:—

"Yesterday French aircraft bombed the Bulgarian town of Porto-Lagos (on the coast of the Aegean, between Kavala and Dedeağatch) and were particularly successful in destroying depôts of munitions. To-day bombs were again dropped on Petritch."



Honours for Zep. Strafers.

It was announced in the *London Gazette* of June 6th, that the Field-Marshal Commanding-in-Chief, Home Forces, has recommended to the Army Council the names of the undermentioned officers for distinguished service in connection with the defence of London against hostile air raids:—

Major F. V. Holt, D.S.O., Oxfordshire and Buckinghamshire Light Infantry and Royal Flying Corps.

Major T. C. R. Higgins, the King's Own (Royal Lancaster Regiment) and Royal Flying Corps.

Second Lieutenant A. de B. Brandon, Royal Flying Corps (Special Reserve).

**Second Lieutenant C. A. Ridley, Royal Fusiliers and Royal Flying Corps.

These officers have shown great bravery and readiness to take risks of all sorts, going up and landing at night in all weathers, more often than not under most dangerous conditions. Second Lieutenant Brandon is the first pilot to succeed in dropping bombs on a Zeppelin at night.

PERSONALS.

Casualties.

Captain ERNEST W. BARRETT, Royal Flying Corps, killed in action, was the second son of Mr. James Barrett, of Seaview, Farnham Road, Bangor, County Down. Educated at Queen's University, Belfast, he was, when war broke out, assistant manager of a rubber plantation in Singapore, and he at once returned home to offer his services. Shortly afterwards, he got his first commission, and his promotion to be Captain was announced only about a fortnight ago. Two of his brothers are also serving, one in the Royal Field Artillery Cadet Corps, and the other in the Royal Irish Fusiliers Cadet Corps.

Second Lieutenant J. L. BURKE, R.G.A., who fell on April 29th, was born in Surrey in 1891, and lived most of his life in Switzerland with his uncle and aunt, Mr. Emanuel Moor, a musical composer, and Mrs. Moor. He studied at Glarisegg School, on the Lake of Constance, and the Gymnase Scientifique, in Lausanne, and then at the Lausanne University. Later, he received an appointment as a civil engineer in the United States. He returned to London to volunteer about four months after war broke out, and while waiting for a commission worked as an engineer in a Government air factory. He was given a commission in the R.G.A., was chosen for trench-mortar work, and went to the Front last January. He had been beside his guns for six days and six nights when he was killed by a German shell. His Captain wrote: "Burke was a splendid officer, a great favourite with all the officers and all the men."

News has reached England of the death at the Front of H. B. CHINNERY, the eldest son of the late W. M. Chinnery, the famous athlete. Born at Teddington, H. B. Chinnery was a stylish batsman and a smart field. He played for Eton against Harrow in 1894 and 1895, making scores of 75 and 64 on the latter occasion. Two years later he was given a thorough trial for Surrey, and for a few weeks he achieved much success, making 577 runs in all, with an innings of 149 against Warwickshire at Birmingham as his best score. His association with Surrey, however, was very brief. Two seasons later he turned out for Middlesex, but his matches for that county, although covering a period of four years, were few, his only innings of much note being one of 100 against Gloucestershire at Lord's. Mr. Chinnery was an officer in the Rifle Brigade. His younger brother, E. F. Chinnery, of the Coldstream Guards and R.F.C., was killed while flying in an aeroplane in January last year.

Captain BERTIE NOEL LUMSDEN, 2nd Seaforth Highlanders, previously reported missing, is now stated to have been killed near Ypres on April 25th, 1915. He is the third son of the late

W. H. Lumsden, of Balmedie, and of Mrs. Lumsden, of Ladybank, Blairs, Aberdeen, to fall during the war. His eldest brother—Major H. T. Lumsden, of the Royal Flying Corps—was killed while flying at Brooklands on June 21st, 1915; and his second brother—Captain C. R. Lumsden, Gordon Highlanders—fell at the Front early in the war. The youngest brother—Captain W. V. Lumsden, Argyll and Sutherland Highlanders—was reported wounded last October. Captain B. N. Lumsden, who was born in 1885, gained his commission in the Seaforth Highlanders in September, 1905, and was gazetted Captain in 1914.

Second Lieutenant ROBERT NEWMAN, Royal Flying Corps, who was killed while flying, was the eldest son of Mr. R. Newman, 246, Finchley Road, Hampstead. He was 21 years of age.

Second Lieutenant EDWARD FREDERICK SHEFFIELD, Royal Flying Corps, who was killed in a parachute descent while on active service, was the only son of the late Mr. F. Sheffield, of Finsbury Park, and of Mrs. H. K. Knowles, of Muswell Hill, N., and was 20 years of age.

Married and to be Married.

The marriage arranged between GEORGE WILLIAM SWANSON, Lieutenant, 4th Hants Regiment and R.F.C., only son of the late William Swanson and Mrs. Swanson, of Fairfield, Kilmunham, Dublin, and BRENDA CHARLOTTE, younger daughter of the late JAMES A. HILL, of Antwicks Manor, Wantage, and Mrs. ARTHUR PRATT, Aston Villa, Francis Road, Bournemouth, took place at St. Clement's Church, Bournemouth, on the 3rd inst.

Items.

Following the successful operation on his ankle on Friday last week, Flight-Lieutenant TENNANT, who was injured in a recent aeroplane accident in Kent, is making very satisfactory progress. The operation was performed by Mr. F. F. Burghard, F.R.C.S., the surgeon in charge of the case. Sir Arbuthnot Lane was present and gave assistance, and both are very satisfied with Mr. Tennant's condition.

Captain FREDERIC GEORGE ALLEYNE ARKWRIGHT, 11th Hussars, of Willersley, Matlock, Derby, who had recently joined the Royal Flying Corps, after having been wounded at the Front, and who was killed in an aeroplane accident at or near Glamis Castle, Forfar, N.B., on October 14th last, aged 29, son of Mr. F. C. Arkwright, of Willersley Hall, and a descendant of the inventor of the spinning jenny, left estate of the gross value of £13,035, of which £12,840 is net personalty. The testator left £50 to Miss Morgan, nurse at the Cottage Hospital, Ashbourne, "when I was ill there in 1912," and £50 to his servant, Private Trussler.



THE DESIGN OF AEROPLANES.

THE merit of the book written by Mr. A. W. Judge, A.R.C.S., under the above title, lies in the fact that it contains in a brief form some of the most useful data relating to the fundamental principles of design, condensed and collected from such sources as have come to be looked upon as authorities on this subject. In the first chapter the general principles involved have been reduced to their simplest form, thus giving a very clear indication of the problems arising out of the relative positions of the four forces acting upon an aeroplane in flight, i.e. weight, lift, resistance, and thrust. There are chapters dealing with estimation of aeroplane weights, application of model tests to full-size machines, characteristic curves of performance, calculation of weights, areas and speeds, &c. The principles of determining and calculating the stresses in wings are also dealt with, and there are chapters on wing construction and undercarriage design. Finally, a chapter has been included dealing with some of the more important mechanical principles involved in the design of an aeroplane and indicating how these may be applied. At the end of the book are some useful tables of weights, strengths and properties of materials, and general information and aeronautical data. Furthermore, a list of books and papers is given for the guidance of students wishing for fuller information upon questions connected with aeroplane design.

This book does not touch, except in the briefest possible manner, on the question of stability and equilibrium, but the author refers to a separate volume entitled "Stability and Control," which presumably will shortly appear in the same series, and in which he says particulars are furnished for the design of all control surfaces, &c. As we have not received this volume for review we are not in a position to judge of its merits, but it appears to us regrettable that this important question has not been included in the present work, or that the supplementary volume should not have been issued simultaneously. This is the first of a series of aeronautical manuals, and is to be

followed by a second volume entitled "The Properties of Wing Sections and Resistance of Bodies," and a third dealing with the construction of and materials for aeroplanes. Published at 9s. net by Messrs. Whittaker and Co., it may be obtained from "FLIGHT" Office for 9s. 5d., post free.



CORRESPONDENCE.

Rigid Airship Construction.

[1924] Now that the value of the rigid airship has been demonstrated in naval warfare, it may be interesting to know that the principle involved in the construction of the girder framework and gondolas of the latest Zeppelins is a British invention. Before Count Zeppelin employed the corrugated aluminium system, I demonstrated the theory on a model which I flew in the *Daily Mail* Competition at the Alexandra Palace in April, 1907. This model was the first all-metal machine to fly; photos, and descriptions appeared in the technical and daily Press at the time. The late Hon. Charles Rolls, in describing the exhibit in the *Daily Mail*, said the system would be extensively used in the future of airship construction. F. Rawson, Esq., Consulting Engineer to the Barton Airship Co., was so impressed with the idea that he got Lord Fletcher Moulton's opinion on the validity of the patent. He reported that the principle of corrugations as applied to airship construction was novel, and constituted a valid patent. Owing to lack of financial help, the provisional patent was abandoned, and the invention became public property. The idea was submitted to the supposed technical experts at the Balloon Factory at Farnborough, but it was of no interest to them. Had the invention been given financial assistance at the time to secure foreign patents, Count Zeppelin would have had to come to England for a licence to use the system.

Lyme Regis.

WILLIAM COCHRANE.

AIRCRAFT IN THE NAVAL BATTLE.

IN an interview given to a representative of the Associated Press of America by a naval officer of high rank, and issued by the Press Bureau, it was stated:—

"The Zeppelins did not play the part which was attributed to them. Only one appeared and remained in action a very brief time, retiring under heavy fire evidently badly damaged. The weather conditions were such that it is doubtful whether any aircraft would have been of much service."

A semi-official story issued in Berlin said:—

"Notwithstanding the fact that the weather was unfavourable for aerial reconnaissance during the two days of the battle, our naval airships and airmen contributed greatly to the success achieved by their reconnoitring and reporting of movements."

The *Daily Mail* correspondent at Copenhagen says:—

"The Zeppelin 'L. 24,' which with five other Zeppelins and several seaplanes took part in the battle, was hit several times forward, and much gas was lost. 'L. 24' was able only to get home with her crew, of whom many were wounded. All her supplies were thrown overboard, and after a narrow escape she reached the Schleswig coast."

According to the *Ribe Stifstidende* the envelope at times was sloping at an angle of 45 degrees. When rounding the southernmost point of Fanoe the airship, over which the crew plainly had no control, drifted over some Danish villages, and finally passed over the village of Hom into German territory.

The *Times* correspondent at Copenhagen, writing on June 3rd, says:—

"Trawlers which have come back to Ringkøbing bring details of the destruction of a Zeppelin, which is also reported by fishermen

from Thyborøn. Two Zeppelins were seen flying low and slowly southwards. One suddenly came down 45 miles off Holmslands Klit, and later there was an explosion and a fire, and a cloud of smoke spread over the sea. The other Zeppelin which managed to leave the scene of the action foundered in flight.

"The damaged 'L. 24,' having reached the mainland at Ribe, strayed about, apparently having lost its way. It flew very low, nearly colliding with a chimney at Hjartslund and frightening the cattle in the fields. It passed the frontier at Hömlund, the German soldiers waving handkerchiefs.

"Yesterday two Zeppelins and three seaplanes were sighted reconnoitring off Blaavandshuk.

"A Zeppelin on Thursday morning passed the line of Danish territory at Nordby, in Fanoe Island. The military post fired warning shots, and the Zeppelin turned west."

A telegram sent out from Berlin on June 4th asserts that no German airships were lost during the battle.

A Central News message from Copenhagen on June 2nd says:—

"A Zeppelin was reported yesterday returning from the North Sea and passing over the west coast of Jutland. It is now stated that this airship when crossing from the coast into North Schleswig passed over Danish territory. The Danish guards fired on the Zeppelin, which then immediately turned and pursued her way outside Danish territory. Later the airship was reported to have dropped to earth evidently in a wrecked condition just after arriving in Germany. Danish vessels arriving in port notify the presence of several Zeppelins during the naval battle. They did not, as far as could be observed, take any active part in the struggle, but were making observations."

sympathy of the people of Leicester were appreciated all over Canada.

Twice Rescued Mechanic.

ONE of the survivors of the battle cruiser "Queen Mary" was Air-Mechanic Wilson, R.N.A.S., who was picked up by the destroyer "Tipperary," which was sunk shortly afterwards. He was eventually picked up by another of our boats and brought to England suffering from a wound on the hip.

Gilbert's Escape.

It now appears that although Gilbert succeeded in escaping from Zurich Barracks on May 24th, it was not until six days later that he managed to cross the frontier into France. He was disguised as an old peasant, and managed to get across the frontier between Collanges and Annemasse.

Aviation in the U.S. Navy.

THE United States Parliament appears to be taking notice of the phases of the present war, as on May 31st it was decided to increase the aviation appropriation in the Naval Bill from 2,000,000 dollars to 3,500,000 dollars.

Another Zeppelin Story.

THE latest Zeppelin story is to hand via Paris and Zurich. This states that on May 29th, "a number of Swiss spectators were able to observe over Lake Constance a new Zeppelin, the dimensions of which exceed those of the airships previously constructed. It is 800 ft. long, and has four armoured cars and seven propellers."

More Zeppelins Destroyed?

A REPORT was received in Amsterdam on May 31st that near Kuprulu, on the Vardar, a Zeppelin came into contact with trees when descending, and was destroyed.

On May 29th it was reported that the bodies of two members of a Zeppelin crew had been washed ashore near Blaavands Huk, on the coast of Jutland. One of them appeared to be an officer belonging to Kiel. A large piece of canvas, believed to have formed part of a Zeppelin, was also said to have been found near Esbjerg.

Zeppelins Back in Belgium.

REPORTS received in Amsterdam from the Belgian frontier state that the number of Zeppelins in the hangars near Brussels have of late been considerably increased.

A German Aerodrome Burnt.

ACCORDING to a report received in Copenhagen on May 29th, some sheds near Dresden Neustadt, containing twenty-four aeroplanes belonging to the military flying school, have been burned down. All the machines were destroyed.

Lord Sydenham and Armstrongs.

ON his appointment as a member of the Air Board, Lord Sydenham has resigned his seat on the Board of Directors of Sir W. G. Armstrong, Whitworth and Co., Ltd.

Zeppelin "Look-Outs."

LORD BERSFORD, in a statement on Sunday to a Press representative, said:

"The British 'look-outs' are cruisers; we have no suitable airships. The Germans have a great advantage by using Zeppelins as 'look-outs.' Every minute of time in the report of a 'look-out' in a sea fight is a priceless jewel. The Germans can tell the allocation of our fleet, while we cannot be certain of the allocation of their fleets unless our cruisers are in the radius of action. We must send heavy cruisers as outside scouts on account of small cruisers being driven in without getting information. A large cruiser can fight and get the information. The Germans could tell to a second when it was time to run before the Grand Fleet could properly engage. I declare it to be a victory for us, hard earned, but a victory. The grand traditions of the British Fleet have been nobly maintained, and our margin of safety remains. As I have said, the Germans had a tremendous advantage in Zeppelins for 'look-outs.' We have no airships suitable for our fleet, and, to get accurate information, we must stand to lose some of our cruisers."

Count Zeppelin's Prophecy.

THAT Count Zeppelin's original ideas were legitimate, as to the use of his airships as naval scouts, is forthcoming in a reminder by the *Cologne Gase te*, that in 1895 a small brochure was issued to naval tacticians, outlining the great service in scouting work which airships could render, and pointing out that if the German authorities possessed the means of giving early and accurate information of the composition of and the direction taken by hostile squadrons hundreds of miles distant, it would prevent mistaken operations, and lead to victorious battles.

A Canadian Flying Corps.

WITH the object of urging the formation of a Canadian Flying Corps, Mr. J. A. D. McCurdy, the Canadian flying pioneer, who was associated with Dr. Graham Bell and Mr. Glenn Curtiss in their early experiments, has arrived in this country. He has laid details of his scheme before the Air Board, and it is stated that Canada is willing to pay for the organisation and upkeep of her own flying corps. It is also urged that it would stimulate recruiting in that many eligible young Canadians would be attracted to the service provided its identity could be retained as a Canadian unit, while the training of pilots would furnish useful work for a number of competent flying officers now idle.

Leicester's Gift to Canada.

IN response to the appeal of the Imperial Air Fleet Committee that local centres of industry should by public subscription raise funds to provide aeroplanes for the use of the Oversea Forces, Sir George Perley, High Commissioner of Canada, at Leicester on Saturday formally received the aeroplane "Leicester." He said Sir Robert Borden had asked him to say that the generosity and



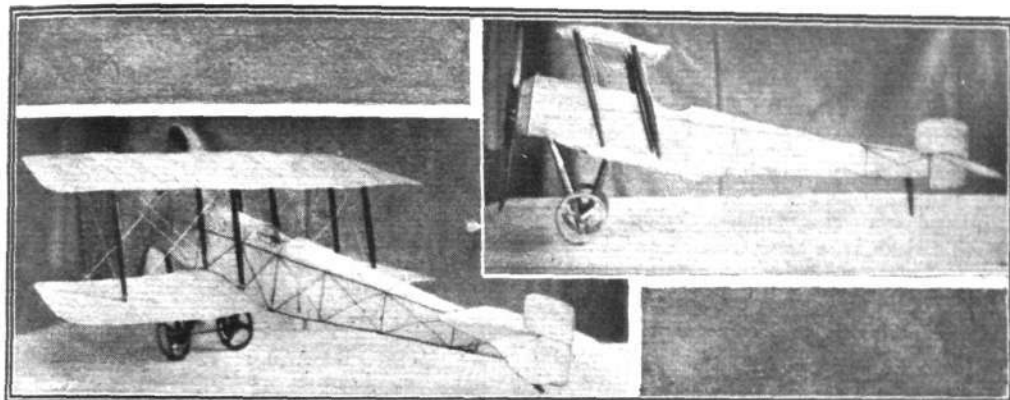
ALL communications in connection with this section should be addressed to the Model Editor, "FLIGHT," 44, St. Martin's Lane, London, W.C. Correspondents are requested to write on one side of the paper only.

A Flying Scale Model.

FROM Mr. W. Burrows, of Fulham, we have received the following:—

"For some time past your model section has contained many photos. of scale models, which though excellent examples of work-

other departure from scale was made, that of placing the centre interplane struts outside the *fuselage*, which enables the wings to be detached. The bottom plane is in two sections, with 1 in. lengths of fine tubing soldered to the leading and trailing edges, where they join the *fuselage*. Two pieces of similar tubing pass through the



Two views of a scale model Bristol, which can be flown, made by Mr. Burrows.

manship and accuracy, in only one or two cases resemble their larger prototypes in the most essential feature, the capacity for sustained flight. Scale models with this capacity have often been suggested in your columns, but, so far as I am aware, no information has been published regarding the results obtained from such a model. I enclose photos. of a model Bristol Scout which was constructed from the scale drawings published in 'FLIGHT,' and with which a serious attempt at flight has been made. The Bristol Scout was selected after consideration on the following lines.

"The full-sized aeroplane and the model differ fundamentally in that the real machine has a motor of great weight suspended at one extremity of a *fuselage*, whilst the model possesses an elastic motor of comparatively light weight distributed equally throughout the entire length of the *fuselage*. Thus the centre of gravity of a full-sized *fuselage* will be very near one end, whilst the c.g. of a model one will be approximately at the centre. In addition the real machine has to carry a pilot, which the model has not, thus making the respective positions of the c.g. still further apart, and thus, as the lifting capacity of a real machine is increased so this distance increases and *vice versa*. If this be true, and I think it is, a machine with very small lifting capabilities will be most suitable for model work, and I think the single-seater scout is the best type to select as fulfilling these requirements, as well as presenting no great constructional difficulties. The Bristol Scout, being the only scale drawing available, was chosen, though, perhaps, the Sopwith chassis, with its small projecting skids, would have afforded better propeller protection. The scale chosen was one-eighth, giving a span of 33 ins. and a length of 28 ins. The entire construction, save the interplane and chassis struts, is of No. 18 s.w.g. steel wire covered with proofed silk, and the complete model weighs 16 ozs. for an area of about $3\frac{1}{2}$ sq. ft., which is, of course, really too heavy. The struts are of mahogany, and fastened to the wire framework by tin brackets. The wheels, fretted out of 3-ply, are rubber sprung according to Bristol practice, and have $\frac{1}{2}$ in. travel upwards. The motor consists of 18 strands of $\frac{1}{4}$ in. strip rubber in three skeins, connected by gearing and driving a 12-in. propeller which was carved from a mahogany block $\frac{1}{8}$ in. thick and $1\frac{1}{2}$ in. wide. When finished the c.g. of the model was found to be approximately at the trailing edge of the upper plane, which was too far back. There were, of course, two remedies for this, the first, and I think the better, to add weight to the front of the *fuselage* and so bring the c.g. forward, but the already excessive weight made this impossible, so the other alternative, to depart from strict scale, was adopted. The tail area was increased by about 60 per cent. and cambered, and satisfactory glides were then obtained. So far no lengthy flights have been made owing to the model landing on one wing and breaking the strut brackets at the conclusion of a flight of about 20 yards at a height of 10 ft. One

fuselage and two knitting needles passing from one plane to the other, *via* the *fuselage* tubes, secure the whole. The top plane is in one piece, and withdrawing the needles leaves the planes and *fuselage* as two separate units. All the materials were supplied by Messrs. J. Bonn and Co., and were very satisfactory. Wishing you every success."

Models of Engines.

One of our Birmingham readers, Mr. C. W. Murrie, writes to say that he is now setting to work on a scale model of a Sopwith Tabloid. Hitherto his efforts at model-making have been confined to engines. He has built one of the Clerget, and is finishing one each of the Thomas and Curtiss aero motors. These models are made out of wood and tin, and we hope to illustrate some of them shortly.

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park & District (66, SOUTH VIEW ROAD, HORNSEY, N.

Monthly Report.—During the past month nearly all available members have been out flying. On May 6th, despite a gully wind, some good work was done. Mr. Coleman was flying his small tractor very well. The best flight of the afternoon was by Mr. A. Richards' monoplane, which was also rather smaller than the usual club standard. Mr. H. Mullin was flying his large Morane well, while two machines, both tractors, were flown by Mr. Rayner. The smaller one of the two was the most successful. May 13th, wet and windy; three machines put in an appearance, Messrs. Richards and Rayner with ordinary tractors and Mr. Coleman with model of freakish design. The 20th was a very eventful day. The weather was ideal for flying. Mr. Coleman's freak monoplane raised the club's tractor duration record to 43 secs., although several flights were judged to be longer than this, although not timed. The duration competition, postponed from February 26th last, was "run off," resulting as follows:—Mr. Coleman, 1st, with 48 points; Mr. Rayner, 28 points; Mr. Richards, 27 points; and Mr. Hardinge, 11 points. It was obvious that the conditions of the contest were not entirely satisfactory, as models of freakish design weighing only 4 ozs. were competing against models of 9 or 10 ounces. A club meeting was held on the 2nd at Mr. Hardinge's house (30 Ronald's Road, Highbury). It was decided to appoint Mr. Hardinge as vice-secretary, and to commence flying at 4 p.m. instead of 3 p.m. during the summer months. The meeting closed with a discussion on freak models and scale models. Although the former are not going to be entirely banned, they will not be allowed to take part in a club competition unless all competing models are of the same style. In short, there will be two classes of competitions. Class A will consist of machines weighing up to 6 ozs., and Class B, machines from 6 ozs. and upwards, with, obviously, a restriction to size in both classes, which has not yet been determined. In reality, freak models are going to be almost discarded. The 27th was a very successful day. Some of the finest flying to be seen was done by Mr. Rayner's large Morane tractor, which has now been fitted with a larger propeller, and more power added. Some good durations were done by Mr. Coleman's very light mono., while Mr. Richards was also flying a light mono. very successfully. A visitor, A. S. Whiffin, of Bromley, Kent, was testing a small tractor, which promises well.

